# SCHOOL OF ENGINEERING & TECHNOLOGY

# DEPARTMENT OF CIVIL ENGINEERING

# Department of Civil Engineering

## Minutes of BOS Meeting

In order to review the scheme of B. Tech. Civil Engineering, a meeting of BOS was conducted in online mode on 2nd of February 2022. This meeting is in continuation of BOS meeting previously held on 29th of May 2021.

The following members were present in the meeting:

| Sr. No. | Name | Designation |
|---------|------|-------------|
| 1 | Dr. Ranjeet Singh Tomar | Dean |
| 2 | Dr. Mukesh Kumar Pandey | Chairman |
| 3 | Mr. Aditya Sharma | Member |
| 4 | Mr. Deepak Rastogi | Expert |
| 5 | Dr. Manish Sharma | Invitee |
| 6 | Er. Abhay Agrawal | Special Invitee |
| 7 | Mr. Pushpak Sahu | Alumni |
| 8 | Dr. Dinesh Singh Tomar | Invitee |
| 9 | Mr. Keshav Kansana | Invitee |

Following decisions were taken after discussion:

1. Approval of minutes of the last BOS meeting held on 29th of May 2021.

2. The scheme of B. Tech. Civil Engineering II semester, IV semester, VI semester, VIII semester for batch of 2022-26 have been approved

3. Based on suggestions given by the members, it is resolved to approve the syllabi with the following modification
   - In III Semester CEL0333[T] Building Planning and Drawing is Introduced as new Course.
   - In CEL 101, Traversing & Triangulation is introduced in Unit-2 & Different types of load is introduced in Unit 3.
   - In CEL 233, Cement sheets (Plain & Corrugated), Aluminium Sheets (Plain & Corrugated), Galvanized Iron Sheets (Plain & Corrugated) is introduced in Unit-2 & Gypsum: Introduction - Gypsum Board, Suspended Ceiling (Board & Tiles), Gypsum Plaster is introduced in Unit-5.
   - In CEL 302, Theory of failure has been added in Unit - 1 & New Unit -5 is been introduced having topic of Thick & thin cylinder.
   - In CEL 303, Bricks & Tiles is replaced with constituents of concrete like Cement, aggregate & water in Unit - 1 & Miscellaneous Construction Materials: Use of fly ash in mortars, lime, Fly ash bricks, Stabilized mud blocks, D.P.C. materials, Building materials made by industrial & agricultural wastes, clay products, P.V.C. materials, advance materials for flooring, doors & windows, Aluminum & glass composites is

removed from Unit -2 & Concrete in aggressive environment: Alkali – aggregate reaction, sulphate attack, chloride attack, acid attack, effect of sea water, special coating for water proofing, sulphate chloride and acid attack, concrete for hot liquids Special concreting techniques: Pumped concrete, concrete, underwater concrete, pre-placed concrete, vacuum dewatered concrete, hot and cold weather concreting, Ready mixed concrete has been added in Unit 3

- In CEL 313, Scope requirement has been added in Unit - 1, Maintenance of surface dressing is introduced in Unit 3, Causes of Failure in Unit-4 & Interpretation of data is introduced in Unit 5.

- In CEL 407, Cross sectioning has been added in Unit - 1, Plotting & adjustment has been added in Unit 2, use of tacheometry for traversing and contouring in Unit-3, Vertical Curves were added in Unit -4 & Introduction to hydrographic survey in Unit 5.

- In CEL 409, Effect of Sinking of support has been introduced in Unit-5

- In CEL 432, Introduction to Limit state design of steel structures Advantages and disadvantages of Steel structures, structural steel sections, loads and load combinations, Limit state design- Design considerations, Failure criteria for steel, codal specifications and section classifications as per IS 800-2007 is been added in Unit 1 & Introduction & Types of Column Bases is been added in Unit 5.

- In CEL 510, Economical sections has been introduced in Unit-3.

- In CEL 511, Digital Planimeter has been introduced in Unit-1& Introduction to marine surveying has been introduced in Unit-2.

- In CEL 512, partial safety factor for load and material in Unit 1 & Design of Short & Long Column in Unit 4 & Introduction & Types of Staircase in Unit 5

- In CEL 514, steps for obtaining I.L for reaction and internal forces in propped cantilever and continuous beams, qualitative I.L for rigid jointed structures having higher degree of statically indeterminacy in Unit 5

- In CEL 515, LATERAL EARTH PRESSURE: Active, Passive and Earth pressure at rest. Rankine's theory of earth pressure, Earth pressures in layered soils, Coulomb's earth pressure theory, Culmann's graphical method.is introduced in Unit 1 & Soil Exploration and Foundations on Expansive and Collapsible soils: Methods of soil exploration. Planning of exploration programme for buildings, highways and earth dams. Disturbed and undisturbed samples and samplers for collecting them. Characteristics of expansive and collapsible soils, their treatment, Construction techniques on expansive and collapsible soils. CNS layer is introduced in Unit 5.

- In CEL 617, Geometry of truss, Lateral stability of truss is introduced in Unit 3 &

Introduction to flexural member is introduced in Unit 5

- In CEL 619, Design of Bunkers & Silos is introduced in Unit 2

- In CEL 621, Abstract Sheet is introduced in Unit 1 & Water supply estimation in Unit 2, C.S.R. in Unit 3, Work charge establishment in Unit 4 & Method of valuation. in Unit 5

- In CEL 634, Theory and design of preliminary treatment such as screens, grit chamber, sedimentation and chemical clarification, role of micro-organism in biological treatment.is introduced in Unit 3

- In CEL 725, Compacting Machine in Unit 2, Administrative approval in Unit 3, Secured advance in Unit 4 & Transportation Model in Unit 5.

- In CEL 827, Galleries in Gravity Dams in Unit 1, Merits & demerits in Rockfill dams in Unit 2, Syphon Aqueduct in Unit 4.

The Board of Studies recommended above discussed points further for approval by Academic Council of the University.

| | | |
|---|---|---|
| Dr. Ranjeet Singh Tomar<br>Dean | Dr. Manish Sharma<br>Invitee | Dr. Mukesh Pandey<br>Chairman |
| Mr. Aditya Sharma<br>Member | Mr. Sohit Agrawal<br>Member | Mr. Deepak Rastogi<br>Expert |
| Mr. Pushpak Sahu<br>Alumni | Er. Abhay Agrawal<br>Special Invitee | Dr. Sanjay Jain<br>Invitee |

Mr. Keshav Kansana
Invitee

Dr. Dinesh Singh Tomar
Invitee

# ANNEXURE I

| Course Code | Course Name | Semester | Number of topics | Change in the number of topics | Change Percentage | Remarks |
|---|---|---|---|---|---|---|
| CEL0101[T] | Introduction to Structural Engineering | I | 55 | 5 | 9.1 | |
| CEL0233[T] | Structural Materials | II | 50 | 10 | 20 | |
| CEL0302[T] | Strength of Materials | III | 43 | 15 | 34.88 | |
| CEL0303[T] | Concrete Technology | III | 70 | 30 | 42.86 | |
| CEL0313[T] | Highway and Traffic Engineering | III | 58 | 4 | 6.9 | |
| CEL0331[T] | Elementary design of structures (RCC) | III | 34 | 0 | 0 | |
| CEL0333[T] | Building Planning and Drawing | III | 41 | 41 | 100 | Newly Added |
| CEL0406[T] | Fluid Mechanics | IV | 54 | 0 | 0 | |
| CEL0407[T] | Fundamentals of Surveying | IV | 69 | 8 | 11.6 | |
| CEL0408[T] | Fundamentals of Geotechnical Engineering | IV | 62 | 0 | 0 | |
| CEL0409[T] | Basic Methods of Structural Analysis | IV | 55 | 6 | 10.1 | |
| CEL0432[T] | Elementary Design of Structures (Steel) | V | 40 | 10 | 25 | |
| CEL0510[T] | Hydraulics & fluid machine | V | 80 | 5 | 6.25 | |
| CEL0511[T] | Advanced Surveying | V | 50 | 2 | 4 | |
| CEL0512[T] | Fundamentals of Structural design(RCC) | V | 36 | 7 | 19.44 | |
| CEL0514[T] | Advanced Methods of Structural Analysis | V | 42 | 8 | 19.05 | |
| CEL0515[T] | Advanced Geotech Engineering | V | 69 | 10 | 14.5 | |
| CEL0617[T] | Basic of Structural Design (Steel) | VI | 36 | 6 | 16.67 | |
| CEL0619[T] | Advanced Structural Design (RCC) | VI | 37 | 2 | 5.41 | |
| CEL0621[T] | Quantity Surveying & Costing | VI | 40 | 5 | 12.5 | |
| CEL0634[T] | Environmental Engineering | VI | 69 | 7 | 10.15 | |
| CEE0601[T] | Water Resource & Irrigation Engineering | VI | 42 | 0 | 0 | |
| CEE0602[T] | Geo-synthetics and Reinforced Soil Structures | VI | 42 | 0 | 0 | |
| CEE0603[T] | Introduction to Finite Element Analysis | VI | 44 | 0 | 0 | |
| CEL0723[T] | Advanced Structural Design(Steel) | VII | 42 | 0 | 0 | |
| CEL0731[T] | Railway Engineering | VII | 46 | 0 | 0 | |
| CEL0725[T] | Introduction to Construction Planning and Management | VII | 47 | 4 | 8.51 | |
| CEE0701[T] | MATRIX ANALYSIS OF STRUCTURES | VII | 42 | 0 | 0 | |
| CEE0702[T] | Advanced Foundation Engineering | VII | 51 | 0 | 0 | |
| CEE0703[T] | Pavement Design | VII | 43 | 0 | 0 | |
| CEE0704[T] | Seismic analysis of structures | VII | 50 | 0 | 0 | |
| CEE0705[T] | Fundamentals of Remote Sensing & GIS | VII | 45 | 0 | 0 | |
| CEE0706[T] | Fluid Dynamics | VII | 46 | 0 | 0 | |
| CEE0707[T] | Wastewater Treatment and Recycling | VII | 44 | 0 | 0 | |
| CEE0708[T] | Sustainable Construction Methods | VII | 48 | 0 | 0 | |
| CEL0831[T] | Retrofitting and rehabilitation of structures | VIII | 62 | 7 | 11.29 | |
| CEL0827[T] | Design of Hydraulic Structures | VIII | 65 | 8 | 12.31 | |
| CEE0807[T] | Plastic design of steel structure | VIII | 48 | 0 | 0 | |
| CEE0808[T] | Building Environment & Services | VIII | 45 | 0 | 0 | |
| CEE0809[T] | Design of Pre stressed Concrete Structure | VIII | 45 | 0 | 0 | |

| CEE0810[T] | Traffic Engineering | VIII | 48 | 0 | 0 | |
|---|---|---|---|---|---|---|
| CEE0811[T] | Energy Efficient and Green Building | VIII | 47 | 0 | 0 | |
| CEE0812[T] | Airport Engineering | VIII | 46 | 0 | 0 | |
| CEE0813[T] | Solid Waste Management | VIII | 52 | 0 | 0 | |
| CEE0814[T] | Urban Transportation Planning | VIII | 42 | 0 | 0 | |

**Total Percentage Change**            **8.90%**

# ITM UNIVERSITY
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# Syllabus-2022-2023

## (SOET)(BTech-CivilEngineering)

| Title of the Course | Building Planning and Drawing |
|---|---|
| Course Code | CEL0333[T] |

## Part A

| Year | | | Semester | | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0 | 0 | 2 | 2 |

| Course Type | Lab only | | |
|---|---|---|---|
| Course Category | Discipline Core | | |
| Pre-Requisite/s | Students must have basic knowledge of Engineering Graphics and Building Elements | Co-Requisite/s | |
| Course Outcomes & Bloom's Level | CO1- To Remember basic fundamentals of building Design(BL1-Remember) CO2- To Understand the concept of drawing basic elements of buildings(BL2-Understand) CO3- To Analyse different techniques for different views of building(BL4-Analyze) CO4- To apply knowledge of different plans on real life building strutures(BL3-Apply) CO5- To develop plans of superstructure and substructure details of a building(BL5-Evaluate) | | |
| Coures Elts | Skill Development ✓ Entrepreneurship ✓ Employability ✓ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗ | SDG (Goals) | |

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| 1 | **Building Elements:** Designing and detailing of various building components & their types such as footing, doors & frames, windows, ventilators, lintels and arches, stairs and staircase. | problem based learning, experimental learning, case study | 5 |
| 2 | **Building Planning:** Orientation, principles of planning, arrangements of rooms, usual requirements & purpose. Size & area restrictions of rooms, doors & windows etc for residential building. Types of buildings, Category of residential housing scheme. | problem based learning, experimental learning, case study | 6 |
| 3 | Architectural aspect of buildings drawing-relevant plan, elevation & section of buildings. | problem based learning, experimental learning, case study | 8 |
| 4 | **Building Services** – Introduction of Building Services like water supply and drainage, electrification, ventilation and lightening and staircases. | problem based learning, experimental learning, case study | 5 |
| 5 | **Town planning:** Principles of town planning regulation and requirements of zoning, Road works and other utilities. | I | 4 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---------|-------|------------------------------------------------------|---------------|-------|
| 1 | Drawing of Substructure Elements | Experiments | BL2-Understand | 2 |
| 2 | Drawing of Superstructure Part 1 | Experiments | BL2-Understand | 2 |
| 3 | Drawing of Superstructure Part 2 | Experiments | BL3-Apply | 2 |
| 4 | Drawing of Plumbing Elements | Experiments | BL3-Apply | 2 |
| 5 | Drawing of Swimming Pool Elements | Experiments | BL4-Analyze | 2 |
| 6 | Drawing of Sanitary elements | Experiments | BL4-Analyze | 2 |
| 7 | Drawing of Electrification elements | Experiments | BL4-Analyze | 2 |
| 8 | Drawing of various types of Buildings | Experiments | BL3-Apply | 2 |

## Part D(Marks Distribution)

| Theory | | | | | |
|--------|--|--|--|--|--|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 20 | 60 | |
| Practical | | | | | |
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 20 | 60 | 0 |

## Part E

| Books | R. S. Malek G. S. Meo, Civil Engineering Drawing, New Asian Delhi |
|---|---|
| Articles | https://www.hitechcaddservices.com/news/types-of-building-drawings/ |
| References Books | B. H. Shukla, Civil Engineering Drawing, Atul Prakashan Ahmedabad |
| MOOC Courses | https://www.mooc-list.com/course/3d-cad-application-coursera |
| Videos | https://www.youtube.com/watch?v=abr2elb24Ps&list=PLAhtOl5kcFk2sgnaaZQaTfqEpd3G5iY6B |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | - | - | 2 | 2 | 1 | - | - | 2 | 2 | 2 | 1 | - | - |
| CO2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | - | - | - | 2 | 2 | 3 | 3 | 3 |
| CO3 | 2 | 1 | 2 | - | - | - | 2 | 2 | - | - | - | 2 | 3 | - | 3 |
| CO4 | 1 | 2 | 2 | 3 | 2 | - | 2 | 1 | - | - | 2 | 2 | 3 | 2 | 2 |
| CO5 | 1 | - | - | 1 | - | - | 1 | - | - | - | - | 1 | - | 1 | 2 |
| CO6 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

# Department of Electronics & Communication Engineering
# ITM University, Gwalior
# Session 2022-2023

## NOTICE

**Date: June 08, 2022**

Members of Board of Studies are being informed regarding the BOS meeting scheduled with the following agenda:

Agenda:

a. Approval of scheme of Examination B. Tech. (I Semester to VIII Semester) for the batch 2022.
b. Approval of syllabi of B. Tech. (I Semester and VIII Semester) for the batch 2022.
c. Review of syllabi of B. Tech. ECE for the batches 2021, 2020, 2019.
d. Approval of new courses for Electives
e. Approval of revisions proposed in the courses.
f. Review of POs and PSOs.

List of members:

| Sr. No. | Name | Designation |
|---|---|---|
| 1. | Prof. (Dr.) Ranjeet Singh Tomar | HOD & Chairman BOS |
| 2. | Prof. (Dr.) Aditya Trivedi | External Expert ABV-IIITM Gwalior |
| 3. | Dr. Mukesh Pandey | Dean SOET |
| 4. | Dr. Shyam Akashe | Member |
| 5. | Dr. Sadhana Mishra | Member |
| 6. | Mr. Mayank Sharma | Member |
| 7. | Mr. Bhupendra Dhakad | Member |
| 8. | Mr. Shailendra Singh Ojha | Member |

The meeting will be held on June 15, 2022 from 2:00PM onwards at conference room MG block.

Cc: VC Office
Registrar Office
Dean Academic Office

Prof.(DR.) Ranjeet Singh Tomar
Head of Department
Electronics & Communication Engg.
ITM University
Gwalior (M.P.)
HoD ECE

# Department of Electronics & Communication Engineering, School of Engineering and Technology (SOET), ITM University, Gwalior Session 2022-2023

**Dated: 15/06/2022**

## Minutes of BOS Meeting

In order to review the schemes and syllabi of B. Tech. Electronics & Communication Engineering a meeting of Board of Studies was conducted on June 15, 2022 at conference room MG Block ground floor.

Agenda was:

a. Approval of scheme of Examination of B. Tech. (I Semester to VIII Semester) for the batch 2022.

b. Approval of syllabi of B. Tech. (I Semester and VIII Semester) for the batch 2022.

c. Review of syllabi of B. Tech. ECE for the batches 2021, 2020, 2019.

d. Approval of new courses for Elective & MOOC courses as audit course

e. Approval of revisions proposed in the courses.

f. Review of POs and PSOs.

The following BOS members were present in the meeting:

| Sr. No. | Name | Designation |
|---------|------|-------------|
| 1. | Prof. Ranjeet Singh Tomar | HOD & Chairman BOS |
| 2. | Prof. Aditya Trivedi | External Expert, ABV-IIITM Gwalior |
| 3. | Prof. Mukesh Kumar Pandey | Dean SOET |
| 4. | Prof. Shyam Akashe | Dean IC, Member |
| 5. | Dr. Sadhana Mishra | Assistant Professor, Member |
| 6. | Mr. Mayank Sharma | Assistant Professor, Member |
| 7. | Mr. Bhupendra Dhakad | Assistant Professor, Member |
| 8. | Mr. Shailendra Singh Ojh | Assistant Professor, Member |

Following decisions were taken after discussion:

1. Examination Schemes of B. Tech. Electronics & Communication Engineering for batch 2022 has been approved.

2. Syllabi of B. Tech. Electronics & Communication Engineering (Specialization in IoT & Sensors) (I & VIII Semester) for batch 2022 has been approved.

3. Following Schemes of examination and Syllabi of B. Tech Electronics & Communication Engineering have been reviewed and approved.

   - B. Tech. Electronics & Communication Engineering Batch 2021, III and IV Semester.
   - B. Tech. Electronics & Communication Engineering Batch 2020, V and VI Semester.
   - B. Tech. Electronics & Communication Engineering Batch 2019, VII and VIII Semester.

4. Making of Modern India MCL0202 of credit 2 has been introduced as a new course from batch 2022 in II Semester.

5. Elective course Electric Vehicle Technology (EVT) ECO0701D of credit 3 has been approved from batch 2022 in VII Semester.

6. No Revisions were carried out in this year for the existing courses.

7. The Board of Studies recommended above discussed points further for approval by Academic Council of the University.

Note: Annexure 1 is containing Syllabus of new courses

Prof.(DR.) Ranjeet Singh Tomar
Head of Department
Electronics & Communication Engg.
ITM University
Gwalior (M.P.)
HOD & Chairman BOS

**Department of Electronics & Communication Engineering**
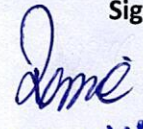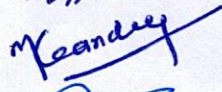**ITM University, Gwalior**
**Session 2022-2023**
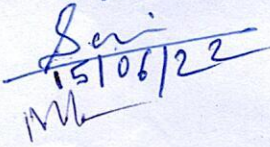
**Dated: 15/06/2022**

**Attendance Sheet**
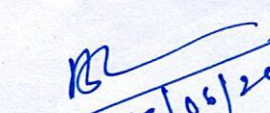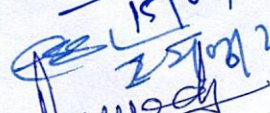
The following members are present in the BOS meeting:

**Name of Members**                                                    **Signature**

1. Prof. Ranjeet Singh Tomar (Dean & Chairman)

2. Prof. Mukesh Kumar Pandey (Dean SOET)

3. Prof. Shyam Akashe (Member)

4. Dr. Sadhana Mishra (Member)

5. Mr. Mayank Sharma (Member)

6. Mr. Bhupendra Dhakad (Member)

7. Mr. Shailendra Singh Ojha (Member)

8. Prof. Aditya Trivedi (External Expert ABV-IIITM Gwalior)

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Annexure 1 Syllabus of new courses introduced

# Syllabus-2022-2023

## (SOET)(BTech-Electronics_and_Communication)

| Title of the Course | Electric Vehicle Technology |
|---|---|
| Course Code | ECO0701A[T] |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 0 | 3 |

| Course Type | Theory only |
|---|---|
| Course Category | Open Elective |
| Pre-Requisite/s | | Co-Requisite/s | |

| Course Outcomes & Bloom's Level | CO1- •CO1: Identify various types of EV's and their characteristics **(BL1-Remember)**<br>CO2- CO2: Describe battery basics and their types in EV and HEV**(BL2-Understand)**<br>CO3- CO3: Identify various types of electrical machines used in EV installation**(BL3-Apply)**<br>CO4- CO4: Describe Solar panel design and integration. **(BL4-Analyze)**<br>CO5- CO5: Identify installation and commissioning of solar panel. **(BL5-Evaluate)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✓<br>Professional Ethics ✓<br>Gender ✗<br>Human Values ✗<br>Environment ✓ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG11(Sustainable cities and economies)<br>SDG12(Responsible consuption and production)<br>SDG13(Climate action) |
|---|---|---|---|

Dr. Sadhana Mishra

## Part B

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| I | UNIT-I The knowledge of Principles of EV and HEV and Basic knowledge about renewable energy sources UNIT-I No. of Lectures: 8 Types of EV : Battery electric vehicles, The IC engine/electric hybrid vehicle, fuelled electric vehicles, Electric vehicles using supply lines, Solar powered vehicles, Electric vehicles which use flywheels or super capacitors, Electric Vehicles for the Future | Lecture Method/Video | 8 |
| II | UNIT-II No. of Lectures: 07 EV Batteries : Electric Vehicle Operation, Battery Basics, Introduction to Electric Vehicle Batteries, Fuel Cell Technology, Choice of a Battery, Electric Vehicle Body and Frame, Fluids, Lubricants, and Coolants, Effects of Current Density on Battery Formation, Effects of Excessive Heat on Battery Cycle Life, Battery Storage, Battery Capacity | Lecture Method/Video Clips/Group Discussion | 8 |
| III | UNIT-III No. of Lectures: 08 Special Electrical Machines for EV : Real-Time Model of a Two-Phase PMSM, PM Brushless DC Machine for EV, Switched Reluctance Motor (SRM) uses in EV, Synchronous Reluctance Motor (SyRM) for EV and HEV, Linear Induction Motor (LIM) – Construction, DC Linear Motor (DCLM) for EV, Analyze the control aspects of brushless DC motor | Lecture Method/Video Clips/Group Discussion | 9 |
| IV | UNIT-IV No. of Lectures: 08 Solar Panel Design and Integration : Solar Radiation Energy Measurements, Estimating Energy requirement, Types of Solar PV System, Design methodology for SPV system, Design of Off Grid Solar Power Plant, Case studies of 3KWp Off grid Solar PV Power Plant, Design and Development of Solar Street Light and Solar Lantern, Off Grid Solar power Plant | Lecture Method/Video Clips/Group Discussion | 10 |
| V | UNIT-V No. of Lectures: 07 Solar Panel Installation and Commissioning : Installation and Trouble shooting of Standalone Solar PV System, Maintenance of Solar PV System, Safety in installation of Solar PV System, Maintenance of Solar PV System. Installation, Commissioning, Trouble shooting of 1KWp off Grid Solar Power Plant, Check list for Solar PV Plant Installation and Commissioning | Lecture Method/Video Clips/Group Discussion | 10 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Babu, A. (n.d.). Electric & Hybrid Vehicles. KHANNA PUBLISHING HOUSE. http://books.google.ie/books?id=AzsIEAAAQBAJ&printsec=frontcover&dq=9789386173713&hl=&cd=1&source=gbs_api Tripathi, P. (2022, June 15). Handbook on Electric Vehicles Manufacturing (E- Car, Electric Bicycle, E- Scooter, E-Motorcycle, Electric Rickshaw, E- Bus, Electric Truck with Assembly Process, Machinery Equipments & Layout). NIIR PROJECT CONSULTANCY SERVICES. http://books.google.ie/books?id=gSZ1EAAAQBAJ&pg=PA351&dq=8195676928&hl=&cd=1&source=gbs_api |
| **Articles** | |
| **References Books** | 1 Mike Blundell and Damian Harty The Multi body systems Approach to Vehicle Dynamics Elsevier, 2004. 2 John Twidell & Toney Weir Renewable Energy Resources E & F N Spon |
| **MOOC Courses** | Electric Vehicles - Part 1 By Prof. Amit Jain | IIT Delhi EV - Vehicle Dynamics and Electric Motor Drives By Prof. Amit Jain, Prof. Avanish Tripathi | IIT Delhi |
| **Videos** | https://www.youtube.com/watch?v=UgtjRob5qMg&list=PLyqSpQzTE6M9spod-UH7Q69wQ3uRm5thr https://www.youtube.com/watch?v=L2HbpEMfryM&list=PLp6ek2hDcoNCROoQbG05xNfiBEY7492Vn |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | -1 | 1 | 1 | 1 | - | 1 | 1 | - | - | - | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 1 | 1 | 1 | 1 | - | - | - | - | 1 | 1 | 3 | 2 | 2 |
| CO3 | 1 | 1 | 1 | 1 | 1 | - | 1 | - | - | - | 1 | - | 2 | 2 | 3 |
| CO4 | 1 | 1 | - | 1 | - | 1 | 1 | - | - | - | 1 | 1 | 2 | 2 | 2 |
| CO5 | 1 | 1 | - | - | - | - | - | - | - | - | 1 | 1 | 3 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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# Syllabus-2022-2023

## (SOET)(BTech-Electronics_and_Communication)

| Title of the Course | Making of Modern India |
|---|---|
| Course Code | MCL0202[T] |

### Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |

| Course Type | Theory only |
|---|---|
| Course Category | Humanities, Social Sciences and Management |

| Pre-Requisite/s | Basic knowledge of social sciences and political sciences. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** At the end of this course, students would be intellectually well equipped to have a sense of modern Indian history and culture.**(BL1-Remember)** <br> **CO2-** The students will have an understanding of making of India as a nation and salient features of modern India**(BL2-Understand)** <br> **CO3-** It will help students to develop their personality and thinking horizon for being a good and concerned Indian citizen**(BL3-Apply)** |
|---|---|

| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✓ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG4(Quality education) <br> SDG5(Gender equality) <br> SDG15(Life on land) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| I | Idea of India in historical perspective a) Indian culture, b) cultural commonness, c)cultural diversities, d)unity in diversity, e) cultural accommodations ,f) cultural conflicts, g)Idea of India and British Rule , h) Role of Indian Intelligentsia. | Lecture Method | 6 |
| II | Emergence and growth of Indian Nationalism a) Anti-colonial basis, b) Economic Nationalism, c) communalism and nationalism, d) revivalism and Indian nationalism, e)Enlightenment values, f)European Nationalism and Indian Nationalism. | Lecture Method | 6 |
| III | Social Reform Movements (a) British Rule and Indian introspection, (b) Raja Rammohan Roy, (c) social reform movements in 19th century, (d)Swami Vivekanand, (e)The women issue, (f)Caste system. | Lecture Method | 6 |
| IV | Indian National Movement (a) Early Revolts and 1857 Revolt, (b)Early Nationalists, (c) Bang Bhang Movement ,(d) Gandhi led Mass Movements, (e) Socialist and Left trends, (f) Princely States and their integration into nation, (h)Partition and Independence . | Lecture Method | 6 |
| V | India after independence a) Making of Indian Constitution, (b) Post Independent Nehru Era, (c) India facing Wars, (d) Indian economy- From Planning to LPG, (e) Achievements, (f) Challenges in 21st century India. | Lecture Method | 6 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| Books | 1. Bipan Chandra and others: India's Struggle For Independence , Penguine Publishers. 2. Bipan Chandra: History Of Modern India, Orient Blackswan publishers. 3. Sunil Khilnani: The Idea of India, Penguine publishers. 4. Shekhar Bandopadhyay: From Plastic to Partition and After, A History of Modern India, Orient Blackswan publishers. 5. Rakesh Batabyal: The Penguine Book of Modern Indian Speeches,1878 to Present, Penguin Publishers. 6. A R Desai:Social Background of Indian Nationalism, Popular Prakashan . 7. B R Nanda: Mahatma Gandhi ,A Biography,London. |
|---|---|
| **Articles** | |
| **References Books** | 1. B.R.Nanda:Gandhi and His Critics, Oxford 2. Girja Shankar: Socialist Trends in Indian National Movement ,Meerut 3. Urmila Phadnis:Towards the integration of Indian States,1919-1947,Mumbai 4. Bimal Prasad: Gandhi,Nehru and JP,A Study in Leadership,New Delhi 5. Bipan Chandra and others:India Since Independence ,Penguine 6. Ramchandra Guha:Makers of Modern India, Penguine. 17. Austin Granville: The Indian Constitution, Oxford |
| **MOOC Courses** | https://ugcmoocs.inflibnet.ac.in/index.php/courses/view_ug/61 |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | 2 | - | - | 1 | - | - | 1 | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | 2 | 1 | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Dr. Sadhana Mishra

# DEPARTMENT OF MECHANICAL ENGINEERING

03 Feb 2022

**Department of Mechanical Engineering**
**Minutes of BoS Meeting**

In order to review the scheme of B.Tech. Mechanical Engineering (Specialization in Manufacturing Technology), a meeting of BoS was conducted in online mode on 03 Feb 2022 due to COVID-19 pandemic. The following members were present in the meeting:

| Sr. No. | Name | Designation |
|---------|------|-------------|
| 1 | Dr. Ranjeet Singh Tomar | Dean |
| 2 | Dr. Mukesh Kumar Pandey | Chairman |
| 3 | Dr. R. K. Jain | Member |
| 4 | Dr. R. S. Rajput | Member |
| 5 | Dr. M. L. Jain | Expert |
| 6 | Dr. Manish Sharma | Invitee |
| 7 | Dr. Dinesh Singh Tomar | Invitee |
| 8 | Mr. Arun Kushwah | Member |
| 9 | Mr. Sateesh Kumar | Member |
| 10 | Mr. Jai Kumar | Member |
| 11 | Dr. Sanjay Jain | Invitee |

Following decisions were taken after discussion:

1. Review/approval of last BoS minutes of meeting held on 28 May 2021 was done.
2. Following revisions were made-
   - B.Tech. Mechanical Engineering (Specialization in Manufacturing Technology) schemes for I- VIII for batch 2021-25 have been reviewed.

   - Mandatory course MCL0202 Making of Modern India was introduced for batch 2022-26 and 2023-27 which includes Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Dept./Branch & Innovations.

| Dr. Mukesh Kumar Pandey | Dr. M. L. Jain | Dr. Rajendra Singh Rajput | Mr. Arun Kushwah | Dr. R. K. Jain | Dr. Ranjeet Singh Tomar |
|---|---|---|---|---|---|

| Mr. Sateesh Kumar | Mr. Jai Kumar | Dr. Sanjay Jain | Dr. Manish Sharma | Dr. Dinesh Tomar |
|---|---|---|---|---|

- CST0201- Programming logics was also introduced as new course in II semester to enhance computer proficiency of students.

- New program electives were introduced in VII and VIII semester. (Annexure-I attached for details)

- The syllabus revisions were incorporated with introduction of 09 new subjects. (Annexure-I attached for details)

The Board of Studies recommended above discussed points further for approval by Academic Council of the University.

Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

**Annexure-I**

# Scheme of Batch 2022-26

## New subjects introduced in II sem-
1. MCL0202- Making of Modern India(New)
2. CST0201- Programming Logics(New)

## Electives of VII semester

### ELECTIVE – 1:
(1) MEE0717- Theory of Production process
(2) MEE0709- Industrial Robotics (New)
(3) MEE0703- Product Design and Development
    (4) MEE0710-Alternative fuels and emission control (New)

### ELECTIVE – 2:
    (1) MEE0705- Non Conventional Energy Resources
    (2) MEE0706- Optimization Methods
    (3) MEE0711- Sensors, Actuators and Signal Conditioning (New)
    (4) MEE0707- Introduction to Computational Fluid Dynamics

## Electives of VIII semester

### ELECTIVE – 3:
(1)MEE 809- Vibration and Noise- Measurement and control
(2) MEE 0817- Simulation and Modeling (New)
(3) MEE 0818- Project Management (New)
(4) MEE 0814- Non-Destructive testing

### ELECTIVE – 4:
(1)MEE 0813- Computer Integrated Manufacturing
(2) MEE 0819- Production and Operation Management (New)
(3) MEE 0820- Machine Learning for Robotics (New)
(4) MEE 0816- Finite Element Method

Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar

| S. No. | Subject Code | Name of Subject | % Change of syllabus revision |
|--------|--------------|-----------------|-------------------------------|
| 1 | MCL0202 | Making of modern India | 100% |
| 2 | CST0201 | Programming Logics | 100% |
| 3 | MEE0709 | Industrial Robotics | 100% |
| 4 | MEE0710 | Alternative fuels and emission control | 100% |
| 5 | MEE0711 | Sensors, Actuators and Signal Conditioning | 100% |
| 6 | MEE 0817 | Simulation and Modeling | 100% |
| 7 | MEE 0818 | Project Management | 100% |
| 8 | MEE 0819 | Production and Operation Management | 100% |
| 9 | MEE 0820 | Machine Learning for Robotics | 100% |
| 10 | MEL0101[T] | Engineering Mechanics | 22.22 |
| 11 | MEL0140[T] | Manufacturing Technology-I | 23 |
| 12 | MEL 0341[T] | Manufacturing Technology –II | |
| 13 | MEL 0310[T] | Mechanics of Solids | 22.22 |
| 14 | MEL0409[T] | Industrial Engineering | 30 |
| 15 | MEL0415[T] | Kinematics of Machines | 25 |
| 16 | MEL0442[T] | Machining processes | |
| 17 | MEL0515[T] | Machine Design-I | 40 |
| 18 | MEL0516[T] | IC Engines | 17.65 |
| 19 | MEL0518[T] | Dynamics of Machines | 18 |
| 20 | MEL0522[T] | Advanced Manufacturing | 60 |
| 21 | MEL0523[T] | Industrial Automation and Control | 33.33 |
| 22 | MEL0627[T] | Additive Manufacturing | 21.43 |
| 23 | MEL0617[T] | Machine Design-II | 25 |
| 24 | MEL0619[T] | Heat and Mass Transfer | 21.43 |
| 25 | MEL0723[T] | Refrigeration and Air Conditioning | 21.43 |
| 26 | MEE0813 | Computer Integrated Manufacturing (Elective4.) | 50 |
| 27 | MEL0825[T] | Automobile Engineering | 26.67 |
| | | **Overall percentage change of syllabus** | **24.68%** |

Dr. Mukesh Kumar
Pandey

Dr. M. L. Jain

Dr. Rajendra Singh
Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet
Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

# Syllabus-2022-2023

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Programming logics |
|---|---|
| Course Code | CST0201[P] |

### PartA

| Year | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|
| | | | | 0 | 0 | 2 | 2 |

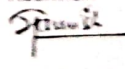| Course Type | Lab only | | |
|---|---|---|---|
| Course Category | Foundation core | | |
| Pre-Requisite/s | Basic understanding of Windows/Linux operating system. | Co-Requisite/s | |
| Course Outcomes & Bloom's Level | **CO1-** Remember: Recall the syntax and basic concepts of C programming.(BL1-Remember)<br>**CO2-** Understand: Explain the meaning of C programming constructs and how they work together(BL2-Understand)<br>**CO3-** Apply :Apply the various conditional and looping statement and functional programming.(BL3-Apply)<br>**CO4-** Analyzing: Analyze and evaluate C programming code to identify errors and optimize performance.(BL4-Analyze)<br>**CO5-** Evaluate : Evaluate the effectiveness of C programming solutions and propose improvements.(BL5-Evaluate) | | |
| Coures Elements | Skill Development✓<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics✗<br>Gender ✗<br>Human Values✗<br>Environment ✗ | SDG(Goals) | SDG4(Quality education) |

Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar
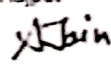
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan
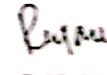
## PartB

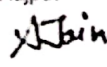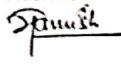| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| 1 | Introduction: Character set, variables and identifiers, built-in data types, arithmetic operators and expressions, constants and literals, simple assignment statements, basic input/output statements, simple 'C'programs. | Demonstration through PPT, Computer | 10 |
| 2 | Conditional Statements and Loops: Decision making within a program, conditions, relational operators, logical connectives, if statement, if-else statement; Loops: while loop, do-while loop, for loop; nested loops, infinite loops; switch statement, structured programming. Array: One Dimensional Arrays - array manipulation, searching, insertion and deletion in an array; Two DimensionalArrays - addition/multiplication of two matrices, transpose of a square matrix; string | Demonstration through PPT, Computer | 10 |
| 3 | Pointer: Address operators, pointer type declaration, pointer assignment, pointer initialization, pointer arithmetic, functions and pointers, arrays and pointers, pointer arrays, dynamic memory allocation. Functions: Standard library functions, prototype of a function, return type, function calling, block structure, passing argumentsto a function - call by reference and call by value; recursive functions, arrays as function arguments. | Demonstration through PPT, Computer | 10 |
| 4 | Structure and Union: Structure variables, initialization, structure assignment, nested structure, structures and functions, structures and arrays - arrays of structure, structures containing arrays, unions. Dynamic Memory Management: Use of malloc, calloc, realloc and free keywords | Demonstration through PPT, Computer | 10 |

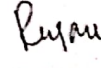Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

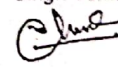Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

Trilok Chauhan

| 5 | File Management: Introduction, defining and opening a file, closing a file, input/output operations on files, error handling during i/o operations, random access to files, programs using files. Command Line Arguments: argv and argc arguments, programs using command line arguments. Preprocessor: Introduction, macro substitution, file inclusion, compiler control directives. | Demonstration through PPT, Computer | 10 |
|---|---|---|---|
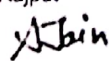
Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

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Mr. Sateesh Kumar

Mr. Jai Kumar
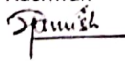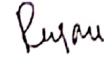
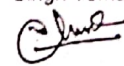Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

Trilok Chauhan

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom'sLevel | Hours |
|---|---|---|---|---|
| 1 | Life Insurance Premium Calculator | Experiments | BL3-Apply | 10 |
| 2-3 | Program to compare best life insurance plan using an array. | PBL | BL4-Analyze | 10 |
| 4-5 | Write a C program to read name and marks of n number of students from user and store them in a file. If the file previously exits, add the information of n students. | PBL | BL5-Evaluate | 20 |

## Part D (Marks Distribution)
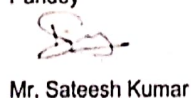
| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | 40 | | | | |
| Practical | | | | | |
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 50 | 40 | 20 | 60 | 0 |

## Part E

| Books | B.W. Kernighan, Dennis M. Ritchi; The C Programming Language; Prentice Hall. |
|---|---|
| Articles | |
| References Books | Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill E. Balagurusamy; Programming in ANSI C; Tata McGraw-Hill Publishing. |
| MOOC Courses | https://www.my-mooc.com/ja/mooc/logic-and-computational-thinking/ |
| Videos | |

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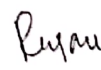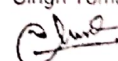
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 1 | - | - | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 1 |
| CO2 | 1 | 2 | 1 | 2 | 2 | 1 | - | - | - | - | - | - | 1 | - | 3 |
| CO3 | 2 | - | 1 | - | - | 2 | - | - | - | - | - | - | 3 | 2 | 2 |
| CO4 | 2 | 1 | - | 2 | 1 | - | - | - | - | - | - | - | 3 | 3 | 2 |
| CO5 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput

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Trilok Chauhan

Dr. Mukesh Kumar
Pandey
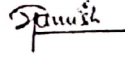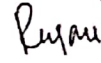
Dr. M. L. Jain

Dr. Rajendra Singh
Rajput

Mr. Arun
Kushwah

Dr. R. K. Jain

Dr. Ranjeet
Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish
Sharma

Dr. Dinesh
Tomar

Trilok
Chauhan

# Syllabus-2022-2023

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Industria lRobotics |
|---|---|
| Course Code | MEE0709 |

### PartA

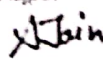| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 1 | 0 | 3 |
| Course Type | Theory only | | | | | | | |
| Course Category | Discipline Electives | | | | | | | |
| Pre-Requisite/s | Engineering mechanics, Machine design | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- 1. Comprehend, classify and analyze the fundamentals of robotics.(BL1-Remember) CO2- 2. Analyze the inverse manipulator kinematics and dynamics.(BL2-Understand)CO3- 3. Gain the knowledge about the manipulator design and mechanism.(BL3-Apply) CO4- 4. Elucidate the role of actuators, drive systems and sensors in robotics.(BL4- Analyze) | | | | | | | |
| Coures Elements | Skill Development✓ Entrepreneurship ✓ Employability ✓ Professional Ethics✗ Gender ✗ Human Values✗ Environment ✗ | SDG(Goals) | SDG9(Industry Innovation and Infrastructure) | | | | | |

Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput
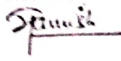
Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma
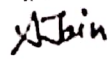
Dr. Dinesh Tomar

Trilok Chauhan

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| Unit:1 | Introduction: Fundamentals and robot components, joints, degrees of freedom, coordinates. The mechanics & control of mechanical manipulators. Spatial Descriptions and Transformations: Descriptions – Positions, Orientations, and Frames, Mappings, Operators – Translations, Rotations, and Transformations, Transformation arithmetic and transform equations, transformation of freevectors, Representation & Orientation. | | |
| Unit:2 | Manipulator Kinematics: Links & Connections. Actuator Space, Joint Space and Cartesian Space, Tools & Computational considerations. | | |
| Unit:3 | Solvability, Algebraic and Geometric, Standard Frames, Repeatability and Accuracy, Jacobians: Velocities and Static Forces: Time varying position and orientation. | | |
| Unit:4 | Linear and rotational velocity of rigid bodies, Jacobians & Singularities, Cartesian transformation of velocities and static forces, Kinematic Configuration, Workspace measures and attributes, Redundant and closed chain structures. Actuation Schemes, Stiffness & Deflections, Position Sensing & Force Sensing. | | |
| Unit:5 | Mass Distribution, Newton's and Euler's Equations, Iterative and Closed Form, Lagrangian formulation of manipulator dynamics, Manipulator Dynamics in Cartesian Space, Non-rigid body effects, Basic components & terminology, System Dynamics, Laplace transform and inverse Laplace transform, First and second order transfer functions, Proportional and proportionalpluscontrollers.Statespace control methodology, Digital control and non-linear control systems. | | |

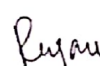Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar
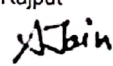
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

## PartD(MarksDistribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## PartE

| | |
|---|---|
| Books | John J. Craig, "Introduction to Robotics Mechanics and Control", Pearson Education Limited 2022<br>Saeed B. Niku, "Introduction to RoboticsAnalysis, Control,Applications", John Wiley &Sons Ltd 2020. |
| Articles | |
| References Books | Nicholas Odrey, Mitchell Weiss, Mikell Groover, Roger Nagel and Ashish Dutta. "Industrial Robotics-Technology, Programming and Applications", McGraw Hill Education; 2nd edition, 2017. |
| MOOC Courses | |
| Videos | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | 2 | 2 | - | - | 3 | 3 | - | - | 3 | 2 | 2 |
| CO2 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | - | 2 | 3 | 1 | - | 3 | 3 | 3 |
| CO3 | 1 | 2 | 3 | 2 | 1 | - | 2 | 2 | 2 | 1 | - | 3 | 3 | 3 | 2 |
| CO4 | 1 | 3 | 3 | 3 | 2 | - | 2 | 2 | - | - | 2 | 2 | 3 | 2 | 2 |
| CO5 | - | 2 | 2 | 2 | 2 | 3 | 3 | - | - | - | 2 | - | 3 | - | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Dr. Mukesh Kumar Pandey
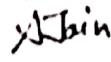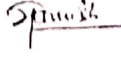
Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar
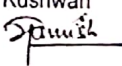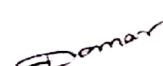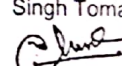
Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

Trilok Chauhan

# ITM
UNIVERSITY
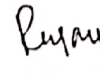
# Syllabus-2022-2023

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Alternative fuels and emission control |
|---|---|
| Course Code | MEE0710 |

## PartA

| Year | | | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | Semester | | | 2 | 1 | 0 | 3 |
| Course Type | Theory only | | | | | | | |
| Course Category | Discipline Electives | | | | | | | |
| Pre-Requisite/s | Basic knowledge of applied chemistry, thermodynamics and IC engines | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- recall the basics of chemistry and thermodynamics (BL1-Remember) <br> CO2- Describe the significance of alternative fuels over conventional fuels(BL2-Understand) <br> CO3-Testthefuelsinvariousengines(BL3-Apply) <br> CO4- Analyze the performance of an engine under standard conditions with a specific alternative fuel(BL4-Analyze) <br> CO5- Evaluate the various alternative fuels and their suitability with a specific engine and environment(BL5-Evaluate) | | | | | | | |
| Course Elements | Skill Development✓ <br> Entrepreneurship ✗ <br> Employability ✓ <br> Professional Ethics✗ <br> Gender ✗ <br> Human Values✗ <br> Environment ✓ | SDG(Goals) | SDG7(Affordable and clean energy) SDG9(Industry Innovation and Infrastructure) | | | | | |

Dr. Mukesh Kumar Pandey

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Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

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## PartB

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-I | Introduction Alternate fuels and renewable sources of energy in automobile field - availabilities, Storage, Handling and Safety aspects- Costs and other factors. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-III | Renewable sources of energies Introduction about the solar energy collectors- Concentrating, Flat plate collectors- application wind energy-Bio energy, Geo thermal energy- Chemical energy: Fuel cells, Batteries; Hydrogen energies- Energy conservations in sterling and heat pumps. | Lectures with whiteboard/PPT, Quiz, Group discussion | |
| Unit-IV | Pollutants: Sources from SI and CI Engines, Two Stroke (SI and CI) engine pollution formation; Indian Emission Standards for SI and CI engines; European Emission Standards Comparison with alternate fuel emissions. | Lectures with whiteboard/PPT, Quiz, Group discussion | |
| Unit-V | Pollution control Techniques and Test procedures: Optimization of operating factor- EGR Fumigation- Air injection-PCV system (opens Closed) Catalytic Converters-Catalyst use of unleaded petrol. Gas Analyzers- Different Smoke meters-Different test methods; Electric Vehicles-Simplelayout- Traction batteries-Re charging methods- rating pollution factors, Fuel Cells. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |

## Part D(Marks Distribution)

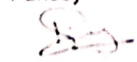| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | | 40 | 12 | 60 | |
| Practical | | | | | |
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | 0 | | | | |

Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

## PartE

| Books | 1. Ganesan V., Internal Combustion Engines. 2. Held P.M., High speed Combustion Engines 3. Rai,GD Non Conventional sources of Energy |
|---|---|
| Articles | |
| References Books | 1.Obert E.F.,InternalCombustionEngines.2.SAE Transaction-Vehicleemission.3.John. H.Jhonson, Diesel Particulate Emissions Landmark Research |
| MOOC Courses | https://www.mooc-list.com/tags/renewable-energy |
| Videos | |

## CourseArticulationMatrix

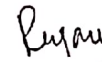| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | 3 | 1 | 3 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 2 | 2 |
| CO2 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

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Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma
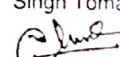
Dr. Dinesh Tomar

Trilok Chauhan

# Syllabus-2022-2023

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Sensors, Actuators and Signal Conditioning |
|---|---|
| Course Code | MEE0711 |

### PartA

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 1 | 0 | 3 |
| Course Type | Theory only | | | | | | | |
| Course Category | Discipline Electives | | | | | | | |
| Pre-Requisite/s | Basic knowledge of measurement and metrology and basic electrical/ electronics engineering. | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1-Torecallthemeasurementandmetrology(BL1-Remember) CO2- To comprehend and classify the behavior of different types of sensors(BL2-Understand) CO3- To implement the data acquisition systems with different sensors for real-time applications.(BL3-Apply) CO4- To conduct experiments and measurements in laboratory and realize hands-on experience on real components, sensors and actuators.(BL4-Analyze) CO5- To evaluate and realize the trends in sensor technology, industrial network and automation.(BL5-Evaluate) | | | | | | | |
| Courses Elements | Skill  Development✓ Entrepreneurship ✗ Employability ✓ Professional Ethics✗ Gender ✗ Human Values✗ Environment ✗ | SDG(Goals) | SDG9(Industry Innovation and Infrastructure) | | | | | |

Dr. Mukesh Kumar Pandey

Dr. M. L. Jain

Dr. Rajendra Singh Rajput
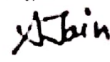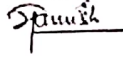
Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

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| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-I | Basics of Energy Transformation - Introduction to sensors and transducers, Principle of sensing and transduction, Classification of sensors. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-II | Performance Characteristics of Sensors - Static characteristics: accuracy, precision, resolution, sensitivity, linearity, span and range - Dynamic characteristics, Mathematical model of transducer: zero, first and second, Response to impulse, step, ramp and sinusoidal inputs, Selection criteria of sensor. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-III | Actuator Performance and Selection-Sensor Technology -Electrical actuating systems: solid-state switches, solenoids and electric motors: DC motor, stepper motor, and Inertial measurement unit, Mechanical actuating systems: types of motion, kinematic chains, cams and gears, Pneumatic and hydraulic actuating systems: diaphragms, bellows and control valves. Process of developing sensors, Trends in sensor technology and IC sensors, Sensor array's and multi-sensor systems, Smart sensors, Industrial network and automation. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-IV | Measurement of Industrial Parameters - Measurement of temperature: thermistorand LM35, Measurement of pressure: strain gauge and piezoelectric type, Measurement of distance: ultrasonic, linear variable differential transformer and capacitance type, proximity sensor, Infrared sensor, Pulse oximeter and Tachometer. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |

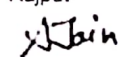Dr. Mukesh Kumar Pandey
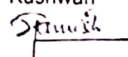
Mr. Sateesh Kumar

Dr. M. L. Jain

Mr. Jai Kumar

Dr. Rajendra Singh Rajput

Dr. Sanjay Jain

Mr. Arun Kushwah

Dr. Manish Sharma

Dr. R. K. Jain

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| Unit-V | Data Acquisition System and Signal Conditioning -Data Acquisition: single channel and multi-channel data acquisition, Data logging, Interfacing of sensors using DAQ cards, Applications: automobile and biological systems. Amplification, Filtering, Multiplexing, Conversion techniques, Sensor interface design: Wheatstone bridge and operational amplifier circuits for various applications. | Lectures with whiteboard/PPT, Quiz, Group discussion | |

Dr. Mukesh Kumar Pandey

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Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

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## PartD(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | | 40 | 12 | 60 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | 0 | | | | |

## PartE

| | |
|---|---|
| Books | D. Patranabis, "Sensors andActuators", 2nd Edition, PHI Learning, New Delhi, India, 2013. Ramon Pallas-Areny, John G. Webster, "Sensors and Signal Conditioning", 2nd Edition, Wiley India Pvt. Ltd., India, 2012. |
| Articles | |
| References Books | D. Patranabis, "Sensors and Transducers", 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, India, 2011. Jon S. Wilson, "Sensor Technology Hand Book", Newnes Publishing Company, Boston, USA, 2005. A.K. Sawhney, Puneet Sawhney, "A Course in Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai and Co. Pvt. Ltd., New Delhi, India, 2014. |
| MOOC Courses | https://onlinecourses.nptel.ac.in/noc19_ee41/preview |
| Videos | |

## Course Articulation Matrix

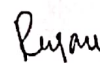| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 3 | - | - | - | 2 | 2 | 2 | 2 | 3 | 3 | - | - | 3 | 2 | 2 |
| CO2 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 1 | - | 3 | 3 | 3 |
| CO3 | 1 | 2 | 3 | - | 1 | 2 | 2 | 2 | 2 | 1 | - | 3 | 3 | 3 | 2 |
| CO4 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 2 |
| CO5 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 1 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Dr. Mukesh Kumar Pandey

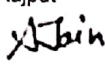Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar
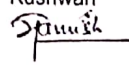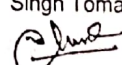
Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

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# Syllabus-2022-2023

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Simulation and Modeling |
|---|---|
| Course Code | MEE0817 |

### PartA

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 1 | 0 | 3 |
| Course Type | Theory only | | | | | | | |
| Course Category | Discipline Electives | | | | | | | |
| Pre-Requisite/s | Knowledge of mechanical systems and computer programming | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- 1. To recall the basic system design of mechanical engineering systems(BL1-Remember)<br>CO2-2.Tounderstandthecomputersystemsimulation(BL2-Understand)<br>CO3- 3. To develop the model considering system and environment(BL3-Apply)<br>CO4- 4. To analyze the results of models.(BL4-Analyze)<br>CO5-5.Toevaluatethedesignthroughvarioussoftware(BL5-Evaluate) | | | | | | | |
| Coures Elements | Skill Development✓<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics✗<br>Gender ✗<br>Human Values✗<br>Environment ✗ | SDG(Goals) | SDG9(Industry Innovation and Infrastructure) | | | | | |

Dr. Mukesh Kumar Pandey

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Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

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## PartB

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| Unit-I | PHYSICALMODELING -Concept of system and environment, continuous and discrete system, linear and nonlinear system, stochastic activities, static and dynamic models, principles used in modeling, Basic simulation modeling, Role of simulation in model evaluation and studies, Advantages and Disadvantages of simulation. Modeling of Systems, Iconic analog; Mathematical Modeling | Lectures with PPT, Quiz, Group discussion, case study | |
| Unit-II | COMPUTERSYSTEMSIMULATION Technique of simulation, Monte Carlo method, experimental nature of simulation, numerical computation techniques, continuous system models, analog and hybrid simulation, feedback systems, Buildings simulation models of waiting line system, Job shop, material handling and flexible manufacturing systems | Lectures with PPT, Quiz, Group discussion, case study | |
| Unit-III | PROBABILITYCONCEPTSIN SIMULATION Stochastic variables, discrete and continuous probability functions, random numbers, generation of random numbers, variance reduction techniques, Determination of the length of simulation runs, Output analysis. | Lectures with PPT, Quiz, Group discussion, case study | |
| Unit-IV | SYSTEMDYNAMICSMODELING Identification of problem situation, preparation of causal loop diagrams and flow diagrams, equation writing, level and rate relationship; Simulation of system dynamics model | Lectures with PPT, Quiz, Group discussion, case study | |
| Unit-V | VERIFICATIONANDVALIDATIONDesign ofsimulationexperiments,validationof experimental models, testing and analysis. Simulation languages comparison and selection, study of SIMULA, DYNAMO, STELLA, POWERSIM; Simulation software | Lectures with PPT, Quiz, Group discussion, case study | |

## PartD(MarksDistribution)

Dr. Mukesh Kumar Pandey

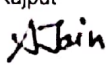Dr. M. L. Jain

Dr. Rajendra Singh Rajput
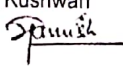
Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

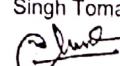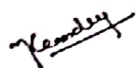Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma

Dr. Dinesh Tomar

Trilok Chauhan

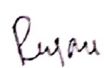| Theory | | | | | |
|--------|--------|--------|--------|--------|--------|
| Total Marks | MinimumPassing Marks | External Evaluation | Min.External Evaluation | Internal Evaluation | Min.Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |
| Practical | | | | | |
| Total Marks | MinimumPassing Marks | External Evaluation | Min.External Evaluation | Internal Evaluation | Min.Internal Evaluation |
| | | | | | |

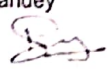Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar
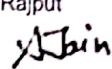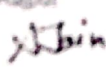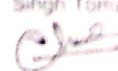
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

## PartE

| Books | 1. Gordon G., System simulation, Prentice Hall. 2. Payer T.,Introduction to system simulation, McGraw Hill. 3. Spriet, ComputerAided Modeling and Simulation. W.I.A. |
|---|---|
| Articles | |
| References Books | 1. Sushil, System Dynamics, Wiley Eastern Ltd. 2. Shannon R.E., System simulation, Prentice Hall. 3.. Allan Carrie, " Simulation and Manufacturing", Jhon Wiley & Sons |
| MOOC Courses | https://www.my-mooc.com/es/mooc/simulation-and-modeling-of-natural-processes/ |
| Videos | |

## CourseArticulationMatrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| CO3 | 1 | 1 | - | - | 1 | 1 | - | - | - | - | 1 | 1 | 2 | 2 | 2 |
| CO4 | 2 | 2 | 1 | - | 2 | 2 | 1 | - | 1 | - | 2 | 1 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 1 | 1 | 3 | 2 | 1 | - | 1 | - | 3 | 1 | 3 | 3 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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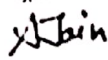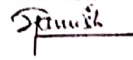
Dr. M. L. Jain

Dr. Rajendra Singh Rajput

Mr. Arun Kushwah

Dr. R. K. Jain

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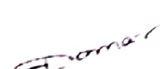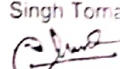
Mr. Sateesh Kumar

Mr. Jai Kumar

Dr. Sanjay Jain

Dr. Manish Sharma
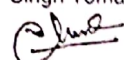
Dr. Dinesh Tomar

Trilok Chauhan

## (SOET)(BTech-Mechanical Engineering)

| Title of the Course | Machine learning for Robotics |
|---|---|
| Course Code | MEE0820 |

### PartA

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 1 | 0 | 3 |
| Course Type | Theory only | | | | | | | |
| Course Category | Discipline Electives | | | | | | | |
| Pre-Requisite/s | Knowledge of basic sciences and machine design. | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- 1. To recall the theoretical foundations of various learning algorithms.(BL1-Remember)<br>CO2- 2. To understand the context of supervised and unsupervised learning through real-life examples.(BL2-Understand)<br>CO3-3.Applyalllearningalgorithmsoverappropriatereal-timedataset.(BL3-Apply)<br>CO4- 4. Evaluate the algorithms based on corresponding metrics identified.(BL4-Analyze)<br>CO5- 5. Analyze the requirements of Machine Learning applications in context-aware robotic environment.(BL5-Evaluate) | | | | | | | |
| Coures Elements | Skill Development✓<br>Entrepreneurship ✓<br>Employability ✓<br>Professional Ethics✗<br>Gender ✗<br>Human Values✗<br>Environment ✗ | SDG(Goals) | SDG9(Industry Innovation and Infrastructure) | | | | | |

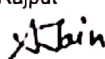Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar
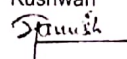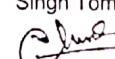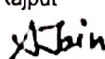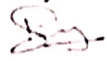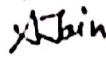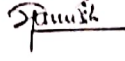
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| Unit-1 | Introduction to Machine Learning Introduction – Exploration – Learning Paradigms – Role of Machine Learning in Robotic applications | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-2 | Supervised Learning – I Linear and Non-Linear – Multi–Class & Multi-Label classification – Linear Regression – Multilinear Regression – Naïve Bayes Classifier – Decision Trees – ID3 – CART– Fine tuning of algorithms for robotic environment. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-3 | Supervised Learning – II K-NN classifier – Logistic regression – Perceptrons – Single layer & Multi-layer – Support Vector Machines – Linear & Non-linear – Error Bounds Fine tuning of algorithms for robotic environment. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-4 | Unsupervised Learning Real time Datasets– Pre-processing Clustering basics (Partitioned, Hierarchical and Density based) - K-Means clustering – K- Mode clustering – Principal Component Analysis – Kernel PCA - Error Bounds – Ensemble Learning (Random Forest, XG Boost) – Fine tuning of algorithms for robotic environment. Class Imbalance – SMOTE – One Class SVM – Optimization of hyper parameters. | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |
| Unit-5 | Reinforcement Learning Robotics & Machine Learning Alliance Basics of RL –RL Framework – Markov Decision Process – Exploration Vs Exploitation Design constraints and considerations – setting up the environment – Applications and case studies in Robotics | Lectures with whiteboard/PPT, Quiz, Group discussion | 8 |

## Part D(Marks Distribution)

| Theory | | | | | |
|--------|--|--|--|--|--|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |

Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar

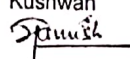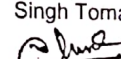Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

| 100 | 40 | 40 | 12 | 60 | |
|-----|----|----|----|----|--|
| Practical | | | | | |

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|-------------|----------------------|---------------------|--------------------------|---------------------|--------------------------|
| | 0 | | | | |

Dr. Mukesh Kumar Pandey    Dr. M. L. Jain    Dr. Rajendra Singh Rajput    Mr. Arun Kushwah    Dr. R. K. Jain    Dr. Ranjeet Singh Tomar
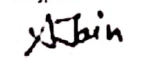
Mr. Sateesh Kumar    Mr. Jai Kumar    Dr. Sanjay Jain    Dr. Manish Sharma    Dr. Dinesh Tomar    Trilok Chauhan

## Part E

| | |
|---|---|
| **Books** | 1 Ethem Alpaydin,"Introduction to Machine Learning", MIT Press, Prentice Hall of India, Third Edition 2014. 2 Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar "Foundations of Machine Learning", MIT Press, 2012. 3 Reinforcement Learning An Introduction (Adaptive Computation and Machine Learning series) 2nd edition, Richard S. Sutton and Andrew G. Barto, A Bradford Book; 2018, ISBN 978-0262039246 |
| **Articles** | |
| **References Books** | 1 Tom Mitchell, "Machine Learning", McGraw Hill, 3rd Edition, 1997. 2 Charu C.Aggarwal, "Data Classification Algorithms and Applications", CRC Press, 2014. |
| **MOOC Courses** | https://www.mooc-list.com/tags/robotics |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 3 | 2 | 1 | - | 1 | 1 | 1 | 1 | - | 1 | 1 | 1 | 1 | 1 | 1 |
| CO2 | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| CO3 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | 1 | 2 | 1 | 2 | 1 | 1 | 2 |
| CO4 | 3 | 2 | 3 | 2 | 3 | 3 | - | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 3 |
| CO5 | 3 | 3 | 3 | 2 | - | - | - | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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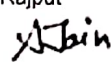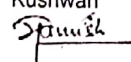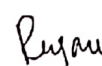
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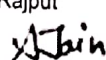
Mr. Arun Kushwah

Dr. R. K. Jain

Dr. Ranjeet Singh Tomar

Mr. Sateesh Kumar

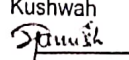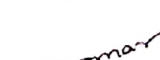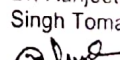Mr. Jai Kumar

Dr. Sanjay Jain
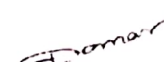
Dr. Manish Sharma
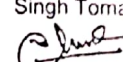
Dr. Dinesh Tomar

Trilok Chauhan

# DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS

**Board of Studies**
**Department of Computer Science and Applications**

## NOTICE

The BOS meeting for the Department of Computer Science and Applications is scheduled for 16-06-2022. The agenda for the meeting is -

1. RenamingofSpecializationsasperAICTE
2. Reviewandapprovalofthefollowingschemeshavetobedone–
   - B.Tech.(CSE)Batch(2022-2026)ItoVIIIsemester
   - B.Tech.(CSE)Batch(2022-2026)SpecializationinArtificialIntelligenceand Machine learning I to VIII semester
   - B.Tech.(CSE)Batch(2022-2026)SpecializationinCyberSecurityItoVIII semester
   - B.Tech.(CSE)Batch(2022-2026)SpecializationinDataScienceItoVIII semester
   - BCA/BCAH(2022-2025)schemeofItoVI semester
   - MCA(2022-2024)schemeofItoIV semester

(Dr.ShashiKantGupta) Chairman
- BOS

**Dated:16/06/2022**

# MinutesofMeeting(BOS)

In order to review the scheme and syllabus of B.Tech, BCA,BCA (H) and MCA of **Departmentof CSA, SchoolofEngineering&Technology,**ITMUniversityGwalior,ameetingofBoardofStudies(BOS)was held on **16/06/2022.**

Thefollowingmemberswerepresentinthemeeting:

| S.No. | Name | Designation | Signature |
|-------|------|-------------|-----------|
| 1. | Dr.MukeshPandey | Dean,SOET | |
| 2. | Dr.ShashikantGupta | Chairman,BOS,Dept. of CSA | |
| 3. | Dr.PallaviKhatri | Member | |
| 4. | Dr.Sanjay Jain | Member | |
| 5. | Dr.ArunYadav | Member | |
| 6. | Dr.AnandPandey | Member | |
| 7. | Mr.H.N.Verma | Member | |
| 8. | Dr.VaniAgrawal | Member | |
| 9. | Mrs.NidhiBirthare | Member | |
| 10. | Mr.K.K. Joshi | Member | |
| 11. | Mrs.Kirti Shrivastava | Member | |
| 12. | Mr.NeerajGoyal | Member | |
| 13. | Mr.RaviRai | Member | |
| 14. | Ms.MonikaDandotiya | Member | |
| 15. | Ms.HarshitaChaurasia | Member | |
| 16. | Ms.HimanshiAgrawal | Member | |
| 17. | Mr.Praveen Gupta | Member | |

| 18. | Ms.ManishaVerma | Member | |
| 19. | Dr.ManishSharma | InviteeMember | |
| 20. | Dr.DineshSingh Tomar | InviteeMember | |
| 21. | Dr.R.S.Jadon, Professor,Dept.ofComputerScience & Technology, MITS, Gwalior | Expert | |
| 22. | Dr. Saurabh Shrivastava, Associate Professor InstituteofBasicScience (DepartmentofMathematical Science and Computer Applications) BundelkhandUniversity,Jhansi | Expert | |
| 23. | Dr.VivekKumarSingh IndustryExpert iNurtureEducationSolutionsPvt. Ltd., Bangalore | Expert | |

Thefollowingdecisionsweretakeninthe BOS meeting:

1. Minutesofthe lastBOSmeetingdated31/05/2021havebeenapproved.
2. B.Tech.SpecializationinDataScienceandMachineLearningwasrenamedasB.Tech.in Artificial Intelligence and Machine Learning.
3. B.Tech.SpecializationinCyberForensicswasrenamedasB.Tech.inCyberSecurity.
4. B.Tech.SpecializationinDataScience was introduced.
5. Following Schemes of examination and Syllabus of B.Tech(CSE) have been reviewed and approved.

   - B.Tech.(CSE)Batch(2022-2026)ItoVIIIsemester

   - B.Tech.(CSE)Batch(2022-2026)SpecializationinArtificialIntelligenceandMachine learning I to VIII semester

   - B.Tech.(CSE)Batch(2022-2026)SpecializationinCyberSecurityItoVIIIsemester

   - B.Tech(CSE)-SpecializationinDataScience-Batch(2022-2026)IandVIIIsemester

6. Fundamentalsofcyber security(CSP0201) have beenaddedasacredit basedsubject inB. TechCSEspecializationwithcybersecuritysecondsemesterinalignmentwithECcouncil certified secure computer user(CSCU) certificate.

7. CryptographyandEncryptionTechnique(CSL0462)asacreditbasedsubjectisaddedin B. Tech CSE specialization with cyber security fourth semester in alignment with EC council certified encryption specialist (ECES) certificate.

8. EthicalHacking(CSL0522)asacreditbasedsubjectisaddedinB.TechCSEspecialization with cyber security fifth semester in alignment with EC council certified ethical hacker (CEH) certificate.

9. Computer Forensics (CSL0621) as a credit based subject is added in B.Tech. CSE specialization with cyber security sixth semester in alignment with EC council certified Computer Hacking Forensic Investigator (CHFI) certificate.

10. CSE0751- Application Security, CSE0752 – Security Operations, CSE0753: Threat IntelligenceaselectivesubjectsisaddedinB.Tech.CSEspecializationwithcybersecurity seventh semester in alignment with EC council certified Application security training (CASE), certified soc analyst csa (CSA), and certified threat intelligence analyst ctia (CTIA) certificates respectively.

11. MOOCasachoice-basedsubjectisintroducedinB.Tech.programfromsemesterIIItoVI for the batch 2022-2026.

12. Course Name Programming Logics (CSL0102) is renamed as Programming using C for the batch 2022-2026.

13. New courses Software Project Management (CSL0808), Communication Skills & Personality Development (HUL0801) and Seminar (CSD0802) are introduced in B.Tech. Normal, and specialization batch of 2022-2026.

14. Webarchitecture&Design(CSL0202)hasbeenremoved fromtheschemeofbatch2022- 2026.

15. OperatingSystem(CSL0306)isconverted into a puretheorypaperforthebatch2022.

16. For the specialization of Artificial Intelligence and Machine Learning, the course Data Analytics and Visualization (CSL0666) was replaced by Digital Image Processing (CSL0661).

17. Engineering Physics (PHL0201) was introduced for the B.Tech. batch 2022-2026 for all specializations.

18. In B.Tech. VI semester Cyber Forensics specialization, course Cyber Laws and Ethics (CSL0622) is replaced with course Data Mining & Data Warehousing (CSL0622).

19. In B.Tech. II semester syllabus of Digital Electronics is updated by merging the unit of Computer System Organization.

20. NCC as a choice-based subject is introduced fromsemester I to VI inB.Tech. 2022-2026 batch.

21. Contents of alltheMathematics subjects runninginthe Department of CSAwerereviewedbythe committee. Recommendations of the committee have been incorporated into the syllabus of mathematics. Course Numerical Analysis and Fuzzy Set were renamed as Numerical Analysis.

22. CSL0501 Artificial Intelligence (except AI&ML specialization), CSL0502 Theory of Computation (except Data Science specialization) and CSL0508 Computer System Organization(exceptCyberSecurityandnon-specialization)werealsoaddedinthescheme of 2022-2026.

23. InB.Tech.Vsemester,fortheDataScienceSpecializationbatch,thefollowingchanges were made for the batch 2022-2026 –
    a. Followingelectiveswereaddedtothescheme–
        i. CSE0518ComputerGraphics
        ii. CSE0517CompilerDesign
        iii. CSE0516 FundamentalsofRprogramming
        iv. CSE0525 NaturalLanguage Processing
        v. CSE0526DigitalImageProcessing
        vi. CSE0527Cloud Computing

    b. Removedsubjectsintheschemeof2022-2026are
        i. CSL0501ComputerGraphicsandMultimedia
        ii. CSL0508BigDataTools
        iii. CSL0516TheoryofComputation
        iv. CSL0563DataMiningandDataWarehousing
        v. CSL0507MachineLearning

24. InB.Tech.Vsemester,fortheArtificialIntelligence&Machine LearningSpecialization batch, the following changes were made for the batch 2022-2026 –
    a. Followingelectives wereaddedtothescheme–
        i. CSE0510InternetofThings
        ii. CSE0513Blockchain
        iii. CSE0511Big Data
        iv. CSE0521Introductionto DataScience
        v. CSE0526DataMiningandDataWarehousing
        vi. CSE0527Cloud Computing

    b. Removedsubjectsintheschemeof2022-2026are
        i. CSL0501ComputerGraphicsandMultimedia
        ii. CSL0508BigDataTools
        iii. CSL0563DataMiningandDataWarehousing

25. InB.Tech.Vsemester,fortheCyberSecuritySpecializationbatch,thefollowingchanges were made for the batch 2022-2026 –
   a. Followingelectiveswereaddedtothescheme–
      i. CSE0519CyberLaws
      ii. CSE0513Blockchain
      iii. CSE0515DistributedDBMS
      iv. CSE0529FundamentalsofSecurity
      v. CSE0528EssentialsofNetworkDefense
      vi. CSE0520InformationRetrieval

   b. DesignandAnalysisofAlgorithmsCSL0507isaddedforthespecialization
   c. Removedsubjectsintheschemeof2022-2026are
      i. CSL0501ComputerGraphicsandMultimedia
      ii. CSL0521Digitalforensics
      iii. CSP0504LinuxProgramming
      iv. CSL0522Ethicalhacking

26. InB.Tech.Vsemester,forthe non-specializationbatch,thefollowingchangeswere made for the batch 2022-2026 –
   a. Followingelectiveswereaddedtothescheme–
      i. CSE0511Big Data
      ii. CSE0515DistributedDBMS
      iii. CSE0529FundamentalsofSecurity
      iv. CSE0528EssentialsofNetworkDefense
      v. CSE0520InformationRetrieval

   b. DesignandAnalysisofAlgorithmsCSL0507isaddedforthespecialization
   c. Removedsubjectsintheschemeof2022-2026are
      i. CSL0501ComputerGraphicsandMultimedia
      ii. CSL0521Digitalforensics
      iii. CSP0504LinuxProgramming
      iv. CSL0522Ethicalhacking

27. InB.Tech.VIsemester,fortheDataScienceSpecializationbatch,thefollowingchanges were made for the batch 2022-2026 –
   a. Followingelectiveswereaddedtothescheme–
      i. CSE0617MachineLearning
      ii. CSE0616InternetofThings
      iii. CSE0614InformationRetrieval
      iv. CSE0621EssentialsofDigitalForensics

      v.   CSE0625WebMiningandSemanticAnalysis

      vi.  CSE0624ComputerVision

  b.  CSL0603BigDataAnalyticsandCSL0604DesignandAnalysisofAlgorithmwere also added in the scheme of 2022-2026 batch.

  c.  Removedsubjectsintheschemeof2022-2026are

      i.   CSL0661DigitalImageprocessing

      ii.  CSL0662CompilerDesign

      iii. CSL0667NeuralNetworkandDeepLearning

      iv. CSL0669FundamentalsofCloudComputing

28. InB.Tech.VIsemester,fortheArtificialIntelligence&MachineLearningSpecialization batch, the following changes were made for the batch 2022-2026 –

  a.  Followingelectiveswereaddedtothescheme–

      i.   CSE0612 QuantumComputing

      ii.  CSE0615Cloud Computing

      iii. CSE0613InformationRetrieval

      iv. CSE0628EvolutionaryAlgorithms

      v.   CSE0622DataAnalytics&Visualization

      vi.  CSE0627BlockchainTechnology

  b.  CSL0605SoftComputingTechniquesandCSL0606DeepLearningwerealso added in the schemes of 2022-2026 batch.

  c.  Removedsubjectsintheschemeof2022-2026are

      i.   CSL0661DigitalImageprocessing

      ii.  CSL0662CompilerDesign

      iii. CSL0667NeuralNetworkandDeepLearning

      iv. CSL0669FundamentalsofCloudComputing

29. InB.Tech.VIsemester,fortheCyberSecurityspecializationbatch,the followingchanges were made for the batch 2022-2026 –

  a.  Followingelectiveswereaddedtothescheme–

      i.   CSE0619EssentialsofEthicalHacking

      ii.  CSE0617MachineLearning

      iii. CSE0612 QuantumComputing

      iv. CSE0621EssentialsofDigitalForensics

      v.   CSE0629NetworkSecurity

      vi.  CSE0626IncidentResponse&SOC Fundamentals

  b.  CSL0601Internet ofThingsandCSL0602CloudComputingwere alsoaddedin the schemes of 2022-2026 batch.

    c. Removedsubjectsintheschemeof2022-2026are
- i. CSL0621ComputerForensics
- ii. CSL0662CompilerDesign
- iii. CSL0622DataMining&Datawarehousing
- iv. CSL0669FundamentalsofCloudComputing

30. InB.Tech.VIsemester,forthenonspecializationbatch,thefollowingchangeswere made for the batches 2022-2026 –

    a. Followingelectiveswereaddedtothescheme–
- i. CSL0601  Internet of things
- ii. CSE0611CompilerDesign
- iii. CSE0612 QuantumComputing
- iv. CSE0613DigitalImageProcessing
- v. CSE0621EssentialsofDigitalForensics
- vi. CSE0622DataAnalytics&Visualization
- vii. CSE0623SoftComputing

    b. CSL0601Internet ofThingsandCSL0602CloudComputingwerealsoaddedinthe schemes of 2022-2026 batch.

    c. Removedsubjectsintheschemeof2022-2026are
- i. CSL0661DigitalImageProcessingis nowreflectedasanelectivesubject
- ii. CSL0662CompilerDesign
- iii. CSL0622DataMining&Datawarehousing
- . CSL0669FundamentalsofCloudComputing

31. InB.Tech.VIIsemester,forAI&MachineLearningSpecializationbatch,thefollowing changes were made for the batch 2022-2026 –

    a. Followingelectiveswereaddedtothescheme–
- i. CSE0710–Bioinformatics
- ii. CSE0715–Cryptography
- iii. CSE0714–Human-Computer Interaction
- iv. CSE0722–Computer Vision
- v. CSE0723–Robotics
- vi. CSE0725–EngineeringOptimizationTechniques

    b. CSL0703NaturalLanguageProcessingwasaddedascoresubjectinVIIsemester for AI & ML Specialization for 2022-2026 batch.

32. InB.Tech.VIIsemester,forDataScienceSpecializationbatch,thefollowingchanges were made for the batches 2022-2026 –

    a. Followingelectiveswereaddedtothescheme–
- i. CSE0711–DeepLearning

  ii. CSE0716–VideoAnalytics

  iii. CSE0717–QuantumComputing

  iv. CSE0721 –Cyber SecurityFundamentals

  v. CSE0724 –EvolutionaryAlgorithms

  vi. CSE0725–EngineeringOptimizationTechniques

 b. CSL0702Cryptographywasaddedascoresubject  inVIIsemesterforData Science Specialization for 2022-2026 batch.

33. InB.Tech.VIIsemester,forCyberSecuritySpecializationbatch,thefollowingchanges were made for the batch 2022-2026 –

 a. Followingelectiveswereaddedtothescheme–

  i. CSE0719–Cloud Security

  ii. CSE0718–WebApplicationSecurity

  iii. CSE0710–Bioinformatics

  iv. CSE0720 –Big DataAnalytics

  v. CSE0729–Threat Intelligence,in2021-2025itscodewas CSE0753

  vi. CSE0727–InformationSecurity&Ethics

 b. CSL0704CyberForensicswasadded inthescheme inplaceofCSL0722 Advance Cloud Computing

34. InB.Tech.VIIsemester,fornon-specializationbatch,thefollowingchangesweremade for the batch 2022-2026 –

 a. Followingelectiveswereaddedtothe scheme

  i. CSE0711–DeepLearning

  ii. CSE0712–AdvancewebTechnology

  iii. CSE0713–FullStackDevelopment

  iv. CSE0721-CyberSecurityFundamentalsandCyberLaw

  v. CSE0728–Bioinformatics

  vi. CSE0726–AugmentedReality

35. InB.Tech.allspecializations,changesdoneinVIIIsemesterforbatch2022-2026were–

 a. CommunicationSkillsandPersonalityDevelopmentHUL0801wasremovedfrom VIII semester and shifted from the syllabus.

 b. CreditsofMajorProjectIIwerechangedfrom16to20 inthe scheme.

 c. CreditsoftheSeminarwerechanged from4to5inthescheme.

36. Schemeof Examination and Syllabusof**MCA (batch2022-2024)**Ito IV semester have been reviewed and approved.

37. Scheme of Examination and Syllabus of **BCA and BCA (Hons)** for batch 2022-2025 I to VI semester have been reviewed and approved.

38. The curriculum is designed to incorporate subjects from various pools as suggested by UGC under the following categories: CC- Core Competency, AEC- Ability Enhancement Course, SEC – Skill Enhancement Course, DSE- Discipline Specific Education, VAC- Value added Course and the distribution of credits is as follows:

| S.No. | Particulars | NumberofCourses | Total Credit | % |
|-------|-------------|-----------------|--------------|-----|
| 1 | CC | 16 | 64 | 51% |
| 2 | AEC | 5 | 10 | 8% |
| 3 | SEC | 6 | 13 | 10% |
| 4 | CE | 4 | 16 | 13% |
| 5 | DSE | 4 | 14 | 11% |
| 6 | VAC | 6 | 6 | 4% |
| 7 | OE | 1 | 2 | 1% |
| Total | | 41 | 125 | |

39. Scheme and Syllabus of the following new courses were approved for BCA

| Program | Course Code | Course name | Semester |
|---------|-------------|-------------|----------|
| BCA | Yoga and Meditation | BCA 207 | II |
| BCA | AI and its Applications | BCA 502 A | V |
| BCA | Information Retrieval | BCA 502(C) (T) | V |
| BCA | Mobile Application Development | BCA 503-A(T) | V |
| BCA | Ethical Hacking Fundamentals | BCA 503-C(T) | V |
| BCA | Democracy and Good Governance | BCA 507 | V |
| BCA | Digital Forensic Essentials | BCA 602(C)-T | VI |
| BCA | Digital Marketing | BCA 603 (B) | VI |
| BCA | Cyber Laws | BCA 603-A | VI |
| BCA | Digital Marketing | BCA 603 (B) | VI |
| BCA | Cyber Laws | BCA 603-A | VI |
| BCA | Mobile Computing | BCA 604 | VI |
| BCA | Human Resource Management | BCA 607 | VI |

| BCA | Web Technologies | BCA- 204 | II |
| BCA | English Language | BCA-106[T] | I |
| BCA | Fundamentals of IOT | BCA-305 | III |
| BCA | Indian Constitution | BCA-307 | III |
| BCA | Entrepreneurship Development | BCA-308 | III |
| BCA | Mathematical Reasoning and Aptitude | BCA-406 | IV |
| BCA | Universal Human Values | BCA-407 | IV |

40. Scheme and Syllabus of the following new courses were approved for BCAH

| Program | Course Code | Course name | Semester |
|---------|-------------|-------------|----------|
| BCA_Hons | Physical Education | BCAH 605(T) | VI |
| BCA_Hons | English Language | BCAH-106 | I |

41. Schemeand Syllabus of the following new courses were approved for BTECH

| Program | Course Code | Course name | Semester |
|---------|-------------|-------------|----------|
| BTECH | Introduction to Data Science | CSE0521[T] | V |
| BTECH | Quantum Computing | CSE0612[T] | VI |
| BTECH | Essentials of Digital Forensics | CSE0621[T] | VI |
| BTECH | Data Analytics & Visualization | CSE0622[T] | VI |
| BTECH | Soft Computing | CSE0623[T] | VI |
| BTECH | Deep Learning | CSE0711[T] | VII |
| BTECH | Full Stack Development | CSE0713[T] | VII |
| BTECH | Augmented Reality | CSE0726[T] | VII |
| BTECH | Bioinformatics | CSE0728[T] | VII |
| BTECH | Personality Development & Communication Skills | HUL0401[T] | IV |
| BTECH | Engineering Physics | PHL0201[T] | II |

One MOOC Course is addedtoeachsemesterasoptionalcredit course from III semester onwards for professional skill development in the scheme of batches 2022-2025

## Annexure1- Syllabus of new courses
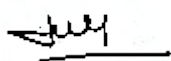
Note:Furtherchangesinanycourseintroducedbytheregularitybodieswillbe incorporated after the approval of BOS/Academic Council.

(sign)

**(Dr.ShashiKantGupta) Chairman, BOS**
**Dept.ofCSA**
**ITMUniversity,Gwalior**
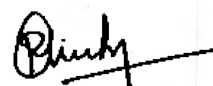
| Title of the Course | English Language |
|---|---|
| Course Code | BCAH-106 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |

| Course Type | Theory only |
|---|---|
| Course Category | Disciplinary Major |

| Pre-Requisite/s | Basic knowledge of set theory. | Co-Requisite/s | Basic knowledge of number theory. |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** Comprehend and summarize characteristics & various structural principles prerequisite to Technical Communication**(BL1-Remember)**<br>**CO2-** Classify and formulate the elementary intricacies of Scientific and Technical Writing using applicative grammar construct.**(BL2-Understand)**<br>**CO3-** Create cohesive technical paragraphs & text.**(BL3-Apply)**<br>**CO4-** Paraphrase text(s) and use appropriate referencing styles.**(BL4-Analyze)**<br>**CO5-** Evaluate the significance of Formal Writing**(BL5-Evaluate)** |
|---|---|

| Coures Elements | Skill Development ✓<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✗<br>Environment ✗ | SDG (Goals) | SDG4(Quality education) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1 | Introduction to Communication Definition, Process, Principles and Types Forms & Grapevine Barriers & Noise | Audio/Video clips, group discussion, lecture with PPTs, quiz | 8 |
| Unit 2 | Language Know-how Common Errors Learning through examples Functional Grammar & Contemporary usage | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 8 |
| Unit 3 | Paragraph Development Techniques Principles & Methods Instruments for Cohesive Writing Creating Mind Maps/Info graphic | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 8 |
| Unit 4 | Writing skills Introduction to writing skills. Tone, Orientation, Attitude, Formal vs Informal, general writing, technical writing □ Letter/ Application/e-mail, Format, and content Indianisms in Email Writing Writing for the Web: Do's & Don'ts of Email Writing, Netiquette | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 8 |
| Unit 5 | Introduction to Report Writing, Objectives of Writing Reports, Significance f Business/Technical, Types and Forms ofReports, Styles of Writing Reports- Printed Format, Memo Format, Letter Format,Book/Letter Text Format. Layout andStructure of Reports, Components of Reports, Writing | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 8 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| Unit II- V | Experiments | Experiments | BL3-Apply | 30 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 40 | 12 | 60 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| Books | Prasad, V., "Advanced Communication Skills", Atma Ram Publications, New Delhi. |
|---|---|
| Articles | Madhukar, R., K, "Business Communication", Vikas Publishing House Pvt. Ltd. |
| References Books | Wren & Martin, (2008), English Grammar and Composition, Sultan Chand &Sons |
| MOOC Courses | https://www.mooc-list.com/course/developing-interpersonal-skills-coursera |
| Videos | https://www.youtube.com/watch?v=X3Fz_Gu5WUE |
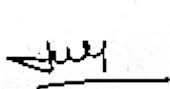
## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 1 |
| CO2 | - | - | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | - | - | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | - | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA_Hons)
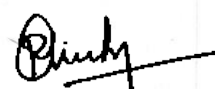
| Title of the Course | Making of Modern India |
|---|---|
| Course Code | BCAH-205 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |
| Course Type | Theory only | | | | | | | |
| Course Category | Disciplinary Major | | | | | | | |
| Pre-Requisite/s | | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- At the end of this course, students would be intellectually well equipped to have a sense of modern Indian history and culture.**(BL1-Remember)** <br> CO2- The students will have an understanding of making of India as a nation.**(BL2-Understand)** <br> CO3- The students will have an understanding of salient features of modern India.**(BL2-Understand)** <br> CO4- It will help students to develop their personality and thinking horizon for being a good and concerned Indian citizen **(BL5-Evaluate)** | | | | | | | |
| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG4(Quality education) | | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| i-1 | Idea of India in historical perspective a) Indian culture, b) cultural commonness, c)cultural diversities, d)unity in diversity, e) culturall accomodations ,f) cultural conflicts, g)Idea of India and British Rule , h) Role of Indian Intelligentsia. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 7 |
| | Emergence and growth of Indian Nationalism a) Anti-colonial basis ,b) Economic Nationalism ,c) communalism and nationalism ,d) revivalism and Indian nationalism ,e)Enlightenment values ,f)European Nationalism and Indian Nationalism | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| | Social Reform Movements a) British Rule and Indian introspection ,b)Raja Rammohan Roy, c) social reform movements in 19th century , d)Swami Vivekanand ,e)The women issue ,f)Caste system | Lectures with whiteboard/PPT, Recorded video/interactive videos | 12 |
| | Indian National Movement a)Early Revolts and 1857 Revolt, b)Early Nationalists ,c) Bang Bhang Movement , d) Gandhi led Mass Movements, e) Socialist and Left trends , f) Princely States and their integration into nation, h)Partition and Independence . | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| | India after independence a)Making of Indian Constitution ,b) Post Independent Nehru Era , c) India facing Wars , d) Indian econmy-From Planning to LPG ,e) Achievements, f) Challenges in 21st century India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 9 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 40 | 40 | 12 | 60 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Rakesh Batabyal: The Penguine Book of Modern Indian Speeches,1878 to Present, Penguine Publishers. |
| **Articles** | |
| **References Books** | B R Nanda: Mahatma Gandhi ,A Biography,London |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| s | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | 1 | - | 2 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO2 | - | - | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| CO3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 3 | 2 | - |
| CO4 | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA_Hons)

| le of the Course | Soft Skills |
|---|---|
| **Course Code** | BCAH-306 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |

| **Course Type** | Theory only |
|---|---|
| **Course Category** | Ability Enhancement Course |

| **Pre-Requisite/s** | 1.Basic Language Proficiency 2.Educational Background 3.Motivation and Willingness to Learn Time Commitment 4.Technology Proficiency | **Co-Requisite/s** | 1.Communication Skills Workshop 2.Emotional Intelligence Training 3.Conflict Resolution Seminar 4.Leadership Development Program 5.Cross-Cultural Competency Training 6.Career Development Workshops |
|---|---|---|---|
| **Course Outcomes & Bloom's Level** | **CO1-** CO1- Determine interpersonal skills and be an effective goal-oriented team player.**(BL1-Remember)** **CO2-** CO2- Elaborate creativity and lateral thinking.**(BL2-Understand)** **CO3-** CO3- Examine attitudes, emotional intelligence and understand its influence on behavior.**(BL3-Apply)** **CO4-** CO4- Justify approaches to conflict resolution**(BL4-Analyze)** **CO5-** CO5- Evaluate goal setting, management, decision-making skills.**(BL5-Evaluate)** | | |
| **Coures Elements** | Skill Development ✓ Entrepreneurship ✗ Employability ✗ Professional Ethics ✗ Gender ✗ Human Values ✗ Environment ✗ | **SDG (Goals)** | SDG4(Quality education) |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Module | Self Analysis - SWOT Analysis, who am I,Attributes, Importance of Self Confidence,Self Esteem. Interpersonal Skills - Gratitude Understanding the relationship betweenLeadership Networking & Teamwork.Assessing Interpersonal Skills Situation description of Interpersonal SkillTeamwork:Necessity of Team Work Personally, Socially and Educationally | Classroom Lecture, PPts, | 10 |
| Module | Creativity - Out of box thinking, Lateral Thinking.Leadership - Skills for a Good Leader, Assessment of Leadership Skills | Audio/Video clips, group discussion, lecture with ppt, Review AnalysisAudio Video Mode | 6 |
| dule | Attitude- Factors influencing Attitude,Challenges, and lessons from Attitude,Etiquette. Emotional Intelligence What isEmotional Intelligence, emotional quotientwhy Emotional Intelligence matters, Emotion Scales. Managing Emotions. | Classroom Lecture, PPts, Videoes | 6 |
| Module | Motivation - Factors of motivation, Self-talk,Intrinsic & Extrinsic Motivators. ConflictResolution - Conflicts in Human Relations –Reasons Case Studies, Approaches to conflict resolution. | Mind Map | 6 |
| dule | Goal Setting - Wish List, SMART Goals,Blueprint for success, Short Term, Long Term, Lifetime Goals. Time Management Value of time, Diagnosing Time Management,Weekly Planner To-do list, Prioritizing work.Extempore Decision Making - Importance and necessity of Decision Making, Process and practical way of Decision Making,Weighing Positives & Negatives. Technical Topic Presentation. | Audio/Video clips, group discussion,lecture with ppt, quizLectures, Case Studies, Experiential Learning | 8 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 00 | | 40 | 12 | 100 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | 0 | | | | |

| | |
|---|---|
| **Books** | Carnegie Dale, How to win Friends and Influence People, New York: Simon & Schuster, 1998. ThomasA Harris, I am ok, You are ok, New York-Harper and Row, 1972 |
| **Articles** | https://www.frontiersin.org/articles/10.3389/feduc.2019.00087/full https://www.cii.co.uk/media/6158020/a-useful-guide-to-swot-analysis.pdf http://www.mmmut.ac.in/News_content/35141tp news_10142020.pdf |
| **References Books** | Covey Sean, Seven Habit of Highly Effective Teens, New York, Fireside Publishers, 1998. Carnegie Dale, How to win Friends and Influence People, New York: Simon & Schuster, 1998. Thomas A Harris, I am ok, You are ok, New York-Harper and Row, 1972 Daniel Coleman, Emotional Intelligence, Bantam Book, 2006 |
| **MOOC Courses** | https://www.edx.org/learn/leadership/catalyst-leading-with-effective-communication-inclusive-leadership-training? hs_analytics_source=referrals&utm_source=mooc.org&utm_medium=referral&utm_campaign=mooc.org-course-list https://www.edx.org/learn/writing/university-of-california-berkeley-academic-and-business-writing? hs_analytics_source=referrals&utm_source=mooc.org&utm_medium=referral&utm_campaign=mooc.org-course-list |
| **Videos** | https://www.youtube.com/watch?v=fq98P9N9Hbg https://www.youtube.com/watch?v=uA5YeqgsjmYhttps://www.youtube.com/watch?v=eBSeCp__xhl |

## Course Articulation Matrix

| Os | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | 3 | - | - | - | 2 | - | 3 | - | - | 3 | 2 | - |
| CO2 | 2 | 3 | - | - | - | - | - | 2 | - | - | - | - | - | 3 | - |
| CO3 | - | - | - | - | - | 1 | - | - | - | - | - | - | 2 | - | - |
| CO4 | - | 2 | - | 2 | - | - | - | 3 | - | - | - | - | - | 3 | - |
| CO5 | 3 | - | 3 | 3 | - | 3 | - | - | - | 3 | - | - | 3 | - | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | 3 | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA_Hons)

| Title of the Course | Indian Constitution |
|---|---|
| Course Code | BCAH-307 |

## Part A

| Year | | Semester | | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2 | 0 | 0 | 2 |

| Course Type | Theory only |
|---|---|
| Course Category | Ability Enhancement Courses |

| Pre-Requisite/s | | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** CO1: To familiarize the students with the key elements of the Indian constitution**(BL2-Understand)**<br>**CO2-** CO2: To enable students to grasp the constitutional provisions and values**(BL2-Understand)**<br>**CO3-** CO3: To acquaint the students with the powers and functions of various constitutional offices and institutions**(BL3-Apply)**<br>**CO4-** CO4: To make students understand the basic premises of Indian politics and role of constitution and citizen-oriented measures in a democracy**(BL2-Understand)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG5(Gender equality)<br>SDG17(Partnerships for the goals) |
|---|---|---|---|

# Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| | Introduction: Indian Constitution: Making and basic premise • Meaning and Significance of Constitution. • Preamble and Salient features of the Indian Constitution. • Sources of Indian constitution. • Fundamental Rights, Fundamental Duties. Directive Principles | Whiteboard, PPT, Video | 6 |
| | Union and State Government • President of India- Election, Powers and functions • Prime Minister and Cabinet – Structure and functions • Governor- Powers and functions • Chief Minister and Council of Ministers – Functions | Whiteboard, PPT, Programming Labs | 6 |
| II | Legislature and Judiciary • Parliament – Lok Sabha and Rajya Sabha – Composition and powers • State Legislative Assembly and Legislative Council – Composition and powers • Judicial System in India – Structure and features • Supreme Court and High Court: Composition, Jurisdiction. | Whiteboard, PPT, Programming Labs | 6 |
| V | Governance and Constitution • Federalism in India – Features • Local Government - Panchayats –Powers and functions; 73rd and 74th amendments • Election Commission – Composition, Powers and Functions; Electoral Reforms • Citizen oriented measures – RTI and PIL – Provisions and significance. | Whiteboard, PPT, Programming Labs | 6 |
| | Miscellaneous • Emergency Provision • Amendment of Constitution • Special Provisions regarding some states • Center-State Relationship • Writs | Whiteboard, PPT, Programming Labs | 6 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 00 | 40 | 40 | 12 | 60 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Pandey, J. N. (2018). The Constitutional Law of India (55th ed.). Allahabad: Central Law Agency.<br>Basu, D. D. (2018). Introduction to the Constitution of India (23rd ed.). Gurgaon: LexisNexis. |
| **Articles** | |
| **References Books** | Jain, M. P. (2017). Indian Constitutional Law (1st ed.). McGraw Hill Education. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | 2 | - | - | - | 2 | 1 | - | - | 2 | - | - | - | - | - |
| CO2 | 1 | 1 | - | - | - | 1 | - | 1 | - | - | 2 | - | - | - | - |
| CO3 | 2 | 1 | - | - | - | 2 | - | 2 | - | - | 1 | - | - | - | - |
| CO4 | 1 | 2 | - | - | - | 1 | - | 1 | - | - | 2 | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA_Hons)

| Title of the Course | Entrepreneurship Development |
|---|---|
| Course Code | BCAH-308 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 0 | 3 |

| Course Type | Theory only |
|---|---|
| Course Category | Interdisciplinary Major |
| Pre-Requisite/s | Students should be familiar with the basic concepts of business. | Co-Requisite/s | |

| Course Outcomes & Bloom's Level | **CO1-** CO1- Students will recall the meaning, definition, and types of entrepreneurs. Students will be able to remember the functions and skills/traits required to be an entrepreneur. **(BL1-Remember)**<br>**CO2-** CO2- Students will be in a position to explain the relationship between entrepreneurs and economic development and will understand the process of creating a business plan and conducting a feasibility study. They can explain the relevance of location, environmental regulatory requirements, and pricing strategies for new businesses**(BL2-Understand)**<br>**CO3-** CO3- Students will be able to apply effective communication, leadership, marketing, and negotiation skills in entrepreneurial contexts. They will also apply time management skills to prioritize tasks and manage resources effectively. (BL3)**(BL3-Apply)**<br>**CO4-** CO4- Students will be able to conduct the cost benefit analysis. They will be able to assess different sources of finance for entrepreneurial ventures and the support provided by government programs, grants, and schemes for entrepreneurs. **(BL4-Analyze)**<br>**CO5-** CO5- Students will be able to evaluate the effectiveness of entrepreneurship development programs (EDPs) and assess the impact of government initiatives such as Make in India and Startup India on entrepreneurship. They will be able to evaluate the challenges faced by women entrepreneurs and propose strategies to overcome them.**(BL5-Evaluate)**<br>**CO6-** CO6- Students will be able to create a comprehensive business plan for a new venture. Moreover, they will be able to design strategies to promote and support women entrepreneurship and create innovative approaches to address the challenges faced by entrepreneurs in India**(BL6-Create)** |
|---|---|

| Coures Elements | Skill Development ✓<br>Entrepreneurship ✓<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✗<br>Environment ✗ | SDG (Goals) | SDG4(Quality education) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Unit-I- Introduction to Entrepreneur & Entrepreneurship Meaning, Definition, types of entrepreneurs, functions, skills/traits required to be an entrepreneur, entrepreneurs and economic development, problems faced by entrepreneurs in India, Social Entrepreneurship. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| | Skills for Entrepreneurs Communication skills, creative thinking skills, leadership skills, marketing skills, negotiation skills, motivational skills, time management skills. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| | Starting a new business Form of business organizations, creating a business plan, feasibility study of business plan, registering a business, relevance of location, environmental regulatory requirements, pricing of products, cost benefit analysis. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| | Support to Entrepreneurs Concept of EDPs, Make in India, Startup India, Sources of Finance for Entrepreneurial Venture, Departments, Grants, Schemes & various policies and programs, Concept of MSMEs, Support to MSMEs in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 5 | Women Entrepreneurship- Concept of women entrepreneurs, role played by women entrepreneurs in economic development, Challenges in being a women entrepreneur, status of women entrepreneurs in India, Strategies to promote women entrepreneurship, Govt. initiatives to promote women entrepreneurship in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 2 | PBL | PBL | BL3-Apply | 15 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 00 | 40 | 40 | 12 | 30 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| Books | Kumar, S. A. (2008). Entrepreneurship Development. New Age International. |
|---|---|
| Articles | |
| References Books | |
| MOOC Courses | |
| Videos | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO2 | - | - | - | - | - | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | 3 | - |
| CO4 | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| CO5 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |
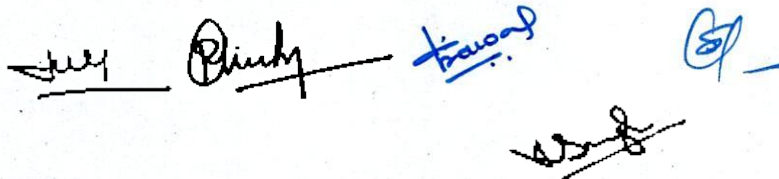
# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC -0202 (T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | CO1- Define thinking, reasoning, critical thinking and creative thinking.(BL1-Remember) <br> CO2- To think critically about different life related issues.(BL2-Understand) <br> CO3- Think divergently and will try to break functional fixedness.(BL3-Apply) <br> CO4- Creatively in their real-life problems.(BL4-Analyze) |
|---|---|

| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG3(Good health and well-being) <br> SDG4(Quality education) <br> SDG5(Gender equality) <br> SDG8(Decent work and economic growth) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development-I | Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking. Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Personality Development-II | Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Leadership Development-I | Leadership capsule. Important Leadership traits, Indicators of leadership and evaluation. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 5 |
| Unit 4. Leadership Development-II | Motivation- Meaning & concept, Types of motivation. Factors affecting motivation. Ethics and Honor codes. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Social Service and Community Development | (i) Protection of Children & Women Safety. (ii) Road/Rail Safety. (iii) New Government Initiatives. (iv) Cyber and mobile Security Awareness. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 0 | 0 | 0 | 0 | 0 | 0 |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|  |  |  |  |  |  |

## Part E

| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
|---|---|
| Articles | https://indiancc.mygov.in/activity/snehahoro/article-on-ncc-camp-and-training/ |
| References Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=N7nNupMdS6c |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# ITM
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CELEBRATING DREAMS

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC 0505(P) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | Co-Requisite/s | |
|---|---|---|---|
| Course Outcomes & Bloom's Level | CO1- Participate in team building exercise and value team work.()<br>CO2- Improve communication skills by public speaking activities. ()<br>CO3- Understand the security mechanism and management of Border/Coastal areas. ()<br>CO4- Get motivated to join armed forces.() | | |
| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education) |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Group Discussions –Team work. (ii) Public speaking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Border & Coastal Areas | Security Setup and Border/Coastal management in the area | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Introduction to Infantry Battalion and its Equipment | Organisation of Infantry Battalion & its weapons | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Military History | Study of Battles of Indo-Pak Wars 1965 & 1971. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Health & Hygiene | (i) Yoga- Introduction, Definition, Purpose, Benefits. (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc. i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene). (ii) First Aid in common medical emergencies. (iii) Treatment & Care of Wounds. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 0 | 0 | 0 | 0 | 0 | 0 |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|  |  |  |  |  |  |

## Part E

| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
|---|---|
| Articles | https://indiancc.mygov.in/ |
| References Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

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# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC 606(P) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Lab only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** Perform foot drill and follow the different word of command. ()<br>**CO2-** Aiming range and figure targets. ()<br>**CO3-** Use the different knots and lashing in day-to-day life for different purposes. ()<br>**CO4-** Develop the feeling of altruism. () |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Ceremonial Drill. (ii) Guard of Honour. | | 4 |
| Unit 2. Weapon Training | Short Range firing. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 5 |
| Unit 3. Map Reading(MR) | Google maps and Applications. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 3 |
| Unit 4. Field Craft & Battle Craft(FCBC) | Knots, Lashing and Stretchers. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 5. Social Service and Community Development(SSCD) | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 6 Introduction of Infantry Weapons &Equipment(INF) | Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 4 |
| Unit 7. Communication (COM) | (i) Basic Radio Telephony (RT) Procedure. (ii) Introduction, Advantages, Disadvantages, Need for standard procedures. 47 (iii) Types of Radio telephony communication. (iv) Radio telephony procedure, Documentation. | Lecture, Tutorials, Group discussion, Collaborative work,self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices | 6 |

## Part D(Marks Distribution)

| | | | Theory | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. In Evalu |
| | | | | | |

| | | | Practical | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. I Eval |
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; R Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Cadet training hand book specialised subjects (2017) |
| **Articles** | https://indiancc.mygov.in/ |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, C Training directive |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=wnzPVZsm_PE |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
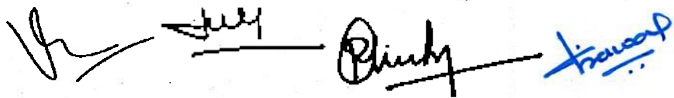
# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC- 0202(P) |

## Part A

| Year | | | Semester | | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0 | 0 | 2 | 2 |

| Course Type | Lab only |
|---|---|
| Course Category | Generic Elective |
| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. |
| Co-Requisite/s | |

| Course Outcomes & Bloom's Level | CO1- Perform foot drill gracefully. ()<br>CO2- Give and follow the different word of command()<br>CO3- Fire a weapon effectively with fair degree of marksmanship. ()<br>CO4- Use of bearing and service protractor and locate the places and objects on the ground. ()<br>CO5- Do the social service and feel connected with social problems.() |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG5(Gender equality) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Foot Drill Dahine, Baen, Aageaur Piche Kadam Lena. (ii) Tej Chal se Murdna, Tej Chal se Salute Karna, Tej Kadam Taal aur Tham, Tej Kadam Taal se Kadam Badalna. (iii) Teeno Teen se Ek File aur ek file se Teeno Teen Banana | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 12 |
| Unit 2. Weapon Training | (i) Range procedure & Theory of group. (ii) Short Range firing. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 4 |
| Unit 3. Map Reading | (i) Protractor Bearing and its conversion methods. (ii) Service protractor and its uses. (iii) Prismatic compass and its uses and GPS. (iv) Navigation by compass and GPS | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 6 |
| Unit 4. Field Craft & Battle Craft | (i) Indications of landmarks and Targets. (ii) Intro, Definitions, Types of Ground, Indication of Landmarks, Methods of iden of targets, difficult targets. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 4 |
| Unit 5. Social Service and Community Development | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and state level. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| **Books** | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| **Articles** | |
| **References Books** | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 |
| **MOOC Courses** | |
| **Videos** | https://www.youtube.com/watch?v=iXzGjyk1wOw |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC-0303(P) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Lab only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | CO1- Perform arm drill gracefully. ()<br>CO2- Give and follow the different word of command. ()<br>CO3- Different positioning for fire and aiming. ()<br>CO4- Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals()<br>CO5- Develop the qualities of patience and confidence and become better individuals. ()<br>CO6- Will develop physical as well as mental fitness. () |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Arm Drill. (ii) Rifle ke saath Savdhan, Vishram aur Aram se. (iii) Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod. (iv) Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 10 |
| Unit 2. Weapon Training & Map Reading | (i) Range procedure & Theory of group. (ii) Short Range firing. (iii) Setting of Map. (iv) Findings North and Own Position. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Obstacle Training | (i) Obstacle training - Introduction, Safety-measures, Benefits. (ii) Obstacle Course-Straight | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Field Craft & Battle Craft | (i) Observation. (ii) Camouflage. (iii) Concealment. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Social Service and Community Development | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 R Gupta ; NCC National Cadet Corps A; B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
|---|---|
| Articles | https://indiancc.mygov.in/activity/tanusreeghosh/ncc-and-its-benifits/ |
| References Books | DG, NCC Training directive Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Indian Constitution |
|---|---|
| Course Code | BCA-307 |

### Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |

| Course Type | Theory only |
|---|---|
| Course Category | Ability Enhancement Courses |

| Pre-Requisite/s | | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** CO1: To familiarize the students with the key elements of the Indian constitution**(BL2-Understand)**<br>**CO2-** CO2: To enable students to grasp the constitutional provisions and values**(BL2-Understand)**<br>**CO3-** CO3: To acquaint the students with the powers and functions of various constitutional offices and institutions**(BL3-Apply)**<br>**CO4-** CO4: To make students understand the basic premises of Indian politics and role of constitution and citizen-oriented measures in a democracy**(BL2-Understand)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG5(Gender equality)<br>SDG17(Partnerships for the goals) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| I | Introduction: Indian Constitution: Making and basic premise • Meaning and Significance of Constitution. • Preamble and Salient features of the Indian Constitution: • Sources of Indian constitution. • Fundamental Rights, Fundamental Duties. Directive Principles | Whiteboard, PPT, Video | 6 |
| II | Union and State Government • President of India- Election, Powers and functions • Prime Minister and Cabinet – Structure and functions • Governor- Powers and functions • Chief Minister and Council of Ministers – Functions | Whiteboard, PPT, Programming Labs | 6 |
| III | Legislature and Judiciary • Parliament – Lok Sabha and Rajya Sabha – Composition and powers • State Legislative Assembly and Legislative Council – Composition and powers • Judicial System in India – Structure and features • Supreme Court and High Court: Composition, Jurisdiction. | Whiteboard, PPT, Programming Labs | 6 |
| IV | Governance and Constitution • Federalism in India – Features • Local Government - Panchayats –Powers and functions; 73rd and 74th amendments • Election Commission – Composition, Powers and Functions; Electoral Reforms • Citizen oriented measures – RTI and PIL – Provisions and significance. | Whiteboard, PPT, Programming Labs | 6 |
| V | Miscellaneous • Emergency Provision • Amendment of Constitution • Special Provisions regarding some states • Center-State Relationship • Writs | Whiteboard, PPT, Programming Labs | 6 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | 0 |
| Practical | | | | | |
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| | |
|---|---|
| **Books** | Pandey, J. N. (2018). The Constitutional Law of India (55th ed.). Allahabad: Central Law Agency.<br>Basu, D. D. (2018). Introduction to the Constitution of India (23rd ed.). Gurgaon: LexisNexis. |
| **Articles** | |
| **References Books** | Jain, M. P. (2017). Indian Constitutional Law (1st ed.). McGraw Hill Education. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 1 | 2 | - | - | - | 2 | 1 | - | - | 2 | - | - | - | - | - |
| CO2 | 1 | 1 | - | - | - | 1 | - | 1 | - | - | 2 | - | - | - | - |
| CO3 | 2 | 1 | - | - | - | 2 | - | 2 | - | - | 1 | - | - | - | - |
| CO4 | 1 | 2 | - | - | - | 1 | - | 1 | - | - | 2 | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Entrepreneurship Development |
|---|---|
| Course Code | BCA-308 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 0 | 3 |

| Course Type | Theory only |
|---|---|
| Course Category | Interdisciplinary Major |
| Pre-Requisite/s | Students should be familiar with the basic concepts of business. | Co-Requisite/s | |

| Course Outcomes & Bloom's Level | **CO1-** CO1- Students will recall the meaning, definition, and types of entrepreneurs. Students will be able to remember the functions and skills/traits required to be an entrepreneur. **(BL1-Remember)**<br>**CO2-** CO2- Students will be in a position to explain the relationship between entrepreneurs and economic development and will understand the process of creating a business plan and conducting a feasibility study. They can explain the relevance of location, environmental regulatory requirements, and pricing strategies for new businesses**(BL2-Understand)**<br>**CO3-** CO3- Students will be able to apply effective communication, leadership, marketing, and negotiation skills in entrepreneurial contexts. They will also apply time management skills to prioritize tasks and manage resources effectively. (BL3)**(BL3-Apply)**<br>**CO4-** CO4- Students will be able to conduct the cost benefit analysis. They will be able to assess different sources of finance for entrepreneurial ventures and the support provided by government programs, grants, and schemes for entrepreneurs. **(BL4-Analyze)**<br>**CO5-** CO5- Students will be able to evaluate the effectiveness of entrepreneurship development programs (EDPs) and assess the impact of government initiatives such as Make in India and Startup India on entrepreneurship. They will be able to evaluate the challenges faced by women entrepreneurs and propose strategies to overcome them.**(BL5-Evaluate)**<br>**CO6-** CO6- Students will be able to create a comprehensive business plan for a new venture. Moreover, they will be able to design strategies to promote and support women entrepreneurship and create innovative approaches to address the challenges faced by entrepreneurs in India**(BL6-Create)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✓<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✗<br>Environment ✗ | SDG (Goals) | SDG4(Quality education) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit-1 | Unit-I- Introduction to Entrepreneur & Entrepreneurship Meaning, Definition, types of entrepreneurs, functions, skills/traits required to be an entrepreneur, entrepreneurs and economic development, problems faced by entrepreneurs in India, Social Entrepreneurship. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 5 |
| 2 | Skills for Entrepreneurs Communication skills, creative thinking skills, leadership skills, marketing skills, negotiation skills, motivational skills, time management skills. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |
| 3 | Starting a new business Form of business organizations, creating a business plan, feasibility study of business plan, registering a business, relevance of location, environmental regulatory requirements, pricing of products, cost benefit analysis. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 4 | Support to Entrepreneurs Concept of EDPs, Make in India, Startup India, Sources of Finance for Entrepreneurial Venture, Departments, Grants, Schemes & various policies and programs, Concept of MSMEs, Support to MSMEs in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 10 |
| 5 | Women Entrepreneurship- Concept of women entrepreneurs, role played by women entrepreneurs in economic development, Challenges in being a women entrepreneur, status of women entrepreneurs in India, Strategies to promote women entrepreneurship, Govt. initiatives to promote women entrepreneurship in India. | Lectures with whiteboard/PPT, Recorded video/interactive videos | 8 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| Books | Khanka, S. S. (2006). Entrepreneurial Development. S. Chand Publishing. |
|---|---|
| Articles | |
| References Books | Mariotti, S., & Glackin, C. (2012). Entrepreneurship and Small Business Management. Pearson Higher Ed. <br><br> Hisrich, R., Shepherd, D., & Peters, M. (2016). Entrepreneurship. McGraw-Hill Education. |
| MOOC Courses | |
| Videos | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| CO2 | - | - | - | - | - | 1 | - | - | 2 | - | - | - | 2 | 3 | 3 |
| CO3 | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | 3 | - |
| CO4 | - | - | 2 | - | - | - | - | - | - | - | - | - | 2 | - | - |
| CO5 | 1 | - | - | 2 | - | - | - | - | - | - | - | - | 2 | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Mathematical Reasoning and Aptitude |
|---|---|
| Course Code | BCA-406 |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 0 | 2 |

| Course Type | Theory only |
|---|---|
| Course Category | Disciplinary Major |

| Pre-Requisite/s | Basic knowledge of mathematical operations. | Co-Requisite/s | Basic knowledge of number system. |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** To get insight the basic concepts of quantitative ability and logical reasoning Skills. **(BL1-Remember)**<br>**CO2-** To understand various techniques to solve real life problems through concepts of logical reasoning.**(BL2-Understand)**<br>**CO3-** To apply reasoning tools for solving various problems like; distance height, calendar, clock, time, work, age and permutation.**(BL3-Apply)**<br>**CO4-** To analyze and solve campus placements aptitude papers covering Quantitative Ability and Logical Reasoning Ability.**(BL4-Analyze)**<br>**CO5-** To evaluate many short tricks for helping to compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC etc.**(BL5-Evaluate)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✓<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✗<br>Environment ✗ | SDG (Goals) | SDG4(Quality education) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| Unit 1 | Problems on Trains, Height and Distance, Calendar, Average, Numbers, Problems on H.C.F and L.C.M, Simplification. | Audio/Video clips, group discussion, lecture with PPTs, quiz | 4 |
| Unit 2 | Surds and Indices, Chain Rule, Boats and Streams, Time and Distance, Time and Work, Problems on Ages. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 3 | Permutation and Combination, Problems on Numbers, Decimal Fraction, Square Root and Cube Root, Ratio and Proportion. ☐ Data Interpretation: Table Charts, Pie Charts, Bar Charts, Line Charts. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 4 | Verbal Reasoning: Logical Sequence of Words, Syllogism, Cause and Effect, Venn Diagrams, Analogy, Character Puzzles, Classification, Arithmetic Reasoning, Blood Relation Test, Series Completion, Dice, Cube and Cuboids, ☐ ☐ Seating Arrangement, Direction Sense Test, Data Sufficiency, Verification of Truth | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |
| Unit 5 | Puzzles: Sudoku, Number puzzles, Missing letters puzzles, Logical puzzles, Clock puzzles. | Audio/Video clips, group discussion, lecture with PPTs, Quiz | 4 |

## Part D(Marks Distribution)

| Theory | | | | | |
|--------|--|--|--|--|--|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

| Practical | | | | | |
|-----------|--|--|--|--|--|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| | |
|--|--|
| **Books** | Dr. R. S. Agarwal, Quantitative Aptitude, S. Chand Publication |
| **Articles** | |
| **References Books** | Abhijit Guha, Quantitative Aptitude for Competitive Examinations, McGraw Hill Publications |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 2 | - | - | - | 2 | 2 | - | 1 | - | - | - | - | 1 | - | 1 |
| CO2 | - | 3 | - | - | 3 | - | - | 1 | - | - | - | - | 1 | - | 3 |
| CO3 | 3 | - | - | 1 | - | - | - | - | - | - | - | - | 3 | - | 3 |
| CO4 | 3 | - | - | 2 | 1 | - | - | - | - | - | - | - | 2 | - | 3 |
| CO5 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | - | 2 | 2 | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Universal Human Values |
| --- | --- |
| Course Code | BCA-407 |

### Part A

| Year | | Semester | | Credits | L | T | P | C |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | 2 | 0 | 0 | 2 |
| Course Type | Theory only | | | | | | | |
| Course Category | Ability Enhancement Courses | | | | | | | |
| Pre-Requisite/s | | | | Co-Requisite/s | | | | |
| Course Outcomes & Bloom's Level | **CO1-** CO1: To help the students appreciate the essential complimentarily between "VALUES" and "SKILLS" to ensure sustained happiness and prosperity which are the core aspirations of all human beings.**(BL2-Understand)**<br>**CO2-** CO2: To facilitate the development of a holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the human reality and the rest of existence. **(BL2-Understand)**<br>**CO3-** CO3: To highlight plausible implications of such a holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and enriching interactions with nature. **(BL3-Apply)**<br>**CO4-** CO4: To provide a much-needed orientation input in value education to the young enquiring minds.**(BL4-Analyze)** | | | | | | | |
| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✓<br>Human Values ✓<br>Environment ✗ | | SDG (Goals) | SDG1(No poverty)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG5(Gender equality)<br>SDG10(Reduced inequalities) | | | | |

Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| I | Introduction to Value Education • Value education: Concept, Need and Process • Self-Exploration- what is it? – its content and process • The basic human aspirations- continuous happiness and prosperity • Method to fulfill the basic human aspiration • Right understanding, Relationship and Physical facility | Whiteboard, PPT, Video | 6 |
| II | Understanding Harmony in the Human Being- Harmony in Myself • Understanding human being as a co-existence of sentient 'I' and material 'Body' • Understanding the needs of ('I') and 'Body' – 'Sukh' and 'Suvidha' • Understanding body as an instrument of 'I' ('I' being the seer, doer and enjoyer) • Understanding the Harmony of 'I' with the Body- 'Sanyam' and 'Swasthya';correct appraisal of physical needs, meaning of prosperity in detail. • Program to ensure Sanyam and Swasthya. | Whiteboard, PPT, Programming Labs | 6 |
| III | Understanding the Harmony in Family and Society- harmony in Human-Human Relationship • Family as basic unit of human interactions and values in Relationships. • Understanding the harmony in Society (society being extension of family): Resolution, Prosperity, fearlessness(trust) and co-existence as comprehensive Human Goals. • Vision of the Universal Human Order • Understanding the meaning of Trust; difference between Intention and Competence. • Understanding the meaning of Respect, difference between Respect and Differentiation; the other salient values in relationship. | Whiteboard, PPT, Programming Labs | 6 |
| IV | Understanding the Harmony in the Nature and Existence – Whole Existence as Coexistence • Understanding the harmony in Nature • Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in Nature • Understanding Existence as Co-existence of mutually interacting units in all-pervasive space • Holistic perception of harmony at all levels of existence | Whiteboard, PPT, Programming Labs | 6 |
| V | Professional Ethics • Definitiveness of Ethical Human Conduct • Providing the basis for Universal Human Values and ethical Human conduct • Professional ethics in the light of right Understanding • Competence in Professional ethics • Strategies for transition towards Value-based life and profession. | Whiteboard, PPT, Programming Labs | 6 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 40 | 12 | 60 | 0 |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| | |
|---|---|
| Books | Naagarazan, R. S. (2020). A Textbook on Professional Ethics and Human Values (1st ed.). New Age International Private Limited.<br>Gaur, R. R., Asthana, R., & Bagaria, G. P. (2019). A Foundation in Human Values and Professional Ethics (2nd ed.). Excel Books. |
| Articles | |
| References Books | Mazumdar, Prof. (2013). Values and Ethics in Profession (3rd ed.). Everest Publishing House.<br>Tripathi, A. N. (2004). Human Values. New Age International Publishers. |
| MOOC Courses | |
| Videos | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | - | - | - | - | - | - | 2 | - | - | 1 | 1 | 1 | 2 |
| CO2 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | 2 | - |
| CO3 | 1 | - | - | - | - | - | - | - | 2 | - | - | 1 | - | 1 | 1 |
| CO4 | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | 1 | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC-0303(T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |
| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | Co-Requisite/s | |

| Course Outcomes & Bloom's Level | CO1- Define thinking, reasoning, critical thinking and creative thinking.() <br> CO2- To think critically about different life related issues.() <br> CO3- Think divergently and will try to break functional fixedness.() <br> CO4- Creatively in their real-life problems() <br> CO5- Understand the organizations related to disaster management and Their functioning.() <br> CO6- Appreciate the role of NCC cadets in disaster management.() |
|---|---|

| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG4(Quality education) <br> SDG6(Clean water and sanitation) <br> SDG13(Climate action) <br> SDG15(Life on land) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Group Discussions - Change your Mindset (ii) Public Speaking. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Leadership Development | Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Disaster management | (i) Disaster Management Capsule. (ii) Organisation. (iii) Types of Disasters. (iv) Essential Services. (v) Assistance. (vi) Civil Defence Organisation. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Border & Coastal Areas | History, Geography & Topography of Border/ Coastal Areas. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. Adventure | Adventure activities. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 0 | 0 | 0 | 0 | 0 | 0 |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| | | | | | |

## Part E

| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
|---|---|
| Articles | |
| References Books | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=kvdDHFALpTw |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC-0404 (T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** Develop the qualities of social skills.() <br> **CO2-** Imbibe leadership qualities. () <br> **CO3-** Be motivated to serve the nation by joining Armed forces. () <br> **CO4-** Contribute in environmental awareness and conservation activities() <br> **CO5-** Keep abreast of current affairs & general awareness.() <br> **CO6-** Effectively contribute in managing disaster relief tasks() |
|---|---|

| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG3(Good health and well-being) <br> SDG4(Quality education) <br> SDG6(Clean water and sanitation) <br> SDG13(Climate action) <br> SDG15(Life on land) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | Group Discussions – Social Skills & Time management. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Leadership Development | Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Disaster management | (i) Initiative Trg, Organising Skills. (ii) Dos and Don'ts. (iii) Natural Disasters. (iv) Man Made Disasters. (v) Fire Services and Fire Fighting. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit-4.Environmental Awareness | Adventure Environmental Awareness and Conservation, Local and global approaches to conserve nature. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 5. General Awareness & Armed Forces | General Awareness, Army, Navy, Air Force and Central Armed Police Forces. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
|---|---|
| Articles | https://indiancc.mygov.in/ |
| References Books | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC-404 (P) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |
| Course Type | Lab only | | | | | | | |
| Course Category | Generic Elective | | | | | | | |
| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | | Co-Requisite/s | | | | | |
| Course Outcomes & Bloom's Level | CO1- Appreciate grace and dignity in the performance of foot drill. ()<br>CO2- Apply signals in there day to day functioning. ()<br>CO3- Provide first aid during the emergencies. ()<br>CO4- Navigate to the given location on ground using compass and GPS. ()<br>CO5- Practice healthy practices for the personal sanitation and hygiene. () | | | | | | | |
| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG11(Sustainable cities and economies)<br>SDG13(Climate action) | | | | |

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | (i) Arm Drill. (ii) Salami Shastra. (iii) Squad Drill with Arms. | | |
| Unit 2.Weapon Training | (i) Range procedure & Theory of group. (ii) Short Range firing. | | |
| Unit 3. Map Reading | (i) Map to Ground. (ii) Ground to Map. | | |
| Unit 4. Field Craft & Battle Craft | (i) Fire and Move Capsule. (ii) Field signal-with hand, with Weapons, Signal with Whistle. (iii) Field signals as means of giving orders. (iv) Field signals by day, Field signals by night. (v) Section Formation. | | |
| Unit 5. Social Service and Community Development | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level. | | |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher Cadet training hand book specialised subjects (2017) |
| Articles | https://indiancc.mygov.in/ |
| References Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=eBA5t4iepAA |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO2 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO3 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO4 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO5 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO6 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC0101[P] |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Lab only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** Perform foot drill and follow the different word of command. **(BL1-Remember)** <br> **CO2-** Fire a weapon effectively with fair degree of marksmanship**(BL2-Understand)** <br> **CO3-** Undertake point to point navigation and take part in route marches by day and night. **(BL4-Analyze)** <br> **CO4-** Perform the social services on various occasions for better community & social life**(BL3-Apply)** |
|---|---|

| Coures Elements | Skill Development ✗ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✓ <br> Environment ✗ | SDG (Goals) | SDG3(Good health and well-being) <br> SDG4(Quality education) <br> SDG17(Partnerships for the goals) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Drill | Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham. | Audio/Video clips, group discussion, lecture with ppt, quiz | 12 |
| Unit 2. Weapon Training (WT) | Introduction & Characteristics of .22 rifle, Handling of .22 rifle. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 5 |
| Unit 3. Map Reading (MR) | Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 3 |
| Unit 4. Field Craft & Battle Craft (FC & BC) | Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 3 |
| Unit 5. Social Service and Community Development (SSCD) | Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 7 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. |
| Articles | |
| References Books | Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=iXzGjyk1wOw |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO2 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO3 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO4 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO5 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |
| CO6 | -   | -   | -   | -   | -   | -   | -   | -   | -   | -    | -    | -    | -    | -    | -    |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC0101[T] |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** To Remember about the history of NCC, its organization, and incentives of NCC for their career prospects and the concept of national integration and its importance.**(BL1-Remember)**<br>**CO2-** To Understand the concept of critical & creative thinking and the concept of self-awareness and emotional intelligence.**(BL2-Understand)**<br>**CO3-** To Acquire knowledge of duties and conduct of NCC cadets.**(BL3-Apply)**<br>**CO4-** To analyze the concept of team and its functioning.**(BL4-Analyze)**<br>**CO5-** To Evaluate the process of decision making & problem solving.**(BL5-Evaluate)** |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG1(No poverty)<br>SDG6(Clean water and sanitation)<br>SDG15(Life on land)<br>SDG16(Peace Justice and strong institutions) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1- NCC General (N) | History of NCC, Aims and Objectives of NCC. Organization &Training. NCC Song, Motto of NCC - Motivation of Cadets. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, discussion (questions & answers section) | 6 |
| Unit 2- NCC Organization | NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct. Preparation and participation. Rank of officers and cadets. | Whiteboard, PPT, Video Case Study, Project Based Activity, Application Based Activity | 6 |
| Unit 3- National Integration (NI) & Awareness | National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security | Audio/Video clips, group discussion, lecture with ppt, classroom presentations | 6 |
| Unit 4- Personality Development | Intra & Interpersonal skills - Self-Awareness-&Analysis, Empathy, Critical & creative thinking, Decision making and problem solving. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. | 6 |
| Unit 5- Social Service and Community Development | Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare. | Lecture with ppt., Diagrams, Flowchart depiction on whiteboard during online/offline lectures, Audio/Video clips, Group discussion. | 6 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

## Part E

| | |
|---|---|
| Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 |
| Articles | https://indiancc.mygov.in/activity/snehahoro/article-on-ncc-camp-and-training/ |
| References Books | DG, NCC Training directive |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=Am1Cs0DHMZ4 |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | NCC |
|---|---|
| Course Code | NCC0606 (T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2 | 0 | 2 | 4 |

| Course Type | Theory only |
|---|---|
| Course Category | Generic Elective |

| Pre-Requisite/s | Should be acquainted with the basics knowledge of General Awareness about Leadership Quality, Personality Development, Defense system etc | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | CO1- Understand individaul responsibilities & role in meetings the security challenges on Border/Coastal areas. ()<br>CO2- Write their CV effective and appealing. ()<br>CO3- Imbibe the feeling of patriotism. ()<br>CO4- Communicate more effectively.()<br>CO5- Face SSB interview effectively in their future. () |
|---|---|

| Coures Elements | Skill Development ✗<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✓<br>Environment ✗ | SDG (Goals) | SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG6(Clean water and sanitation) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---|---|---|---|
| Unit 1. Personality Development | (i) Career Counselling. (ii) SSB Procedure. (iii) Interview Skills. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 2. Border & Coastal Areas | Security Challenges & Role of cadets in Border management. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 3. Armed Forces | Modes of Entry into Army, Police and CAPF. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit 4. Military History | (i) Biographies of Renowned Generals. (ii) War Heroes : Param Veer Chakra Awardees. (iii) Study of Battles of Kargil. (iv) War Movies. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |
| Unit-5.Communication | Introduction to Communication & Latest Trends. | Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion | 5 |

## Part D(Marks Distribution)

### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| | | | | | |

## Part E

| Books | R Gupta ; NCC National Cadet Corps A, B & C Certificate Examination Book; Ramesh Publishing House, 2018. Singh, Neeraj; A Hand Book of NCC; Kanti Prakashan Publisher |
|---|---|
| Articles | https://indiancc.mygov.in/ |
| References Books | Cadets training handbook common subjects (2017), D.G NCC Delhi-110030 DG, NCC Training directive |
| MOOC Courses | |
| Videos | https://www.youtube.com/watch?v=O8plJglsYUE |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
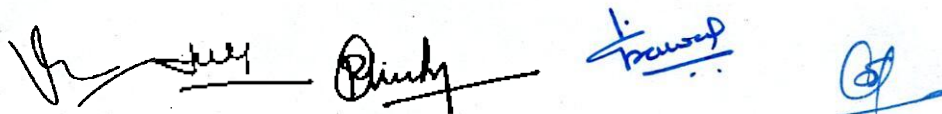
# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Image Processing |
|---|---|
| Course Code | BCA 602 (A)(T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 1 | 4 |

| Course Type | Embedded theory and lab |
|---|---|
| Course Category | Disciplinary Minor |
| Pre-Requisite/s | Prerequisite: student must be familiar with the following: ❖ Undergraduate level mathematics. ❖ Programming in MatLab. | Co-Requisite/s | |
| Course Outcomes & Bloom's Level | **CO1-** To remember various concept of digital image processing.**(BL1-Remember)** <br> **CO2-** To understand the fundamental concepts of a digital image processing system.**(BL2-Understand)** <br> **CO3-** Apply the concepts learnt in to design and implement with Matlab algorithms for digital image processing operations such as histogram equalization, enhancement, restoration and filtering.**(BL3-Apply)** <br> **CO4-** Analyze the concept of designing after applying these techniques in various applications.**(BL4-Analyze)** <br> **CO5-** Evaluate the theoretical knowledge and practical skills on digital image processing.**(BL5-Evaluate)** |

| Coures Elements | Skill Development ✓ <br> Entrepreneurship ✗ <br> Employability ✗ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✗ <br> Environment ✗ | SDG (Goals) | SDG1(No poverty) <br> SDG2(Zero hunger) <br> SDG3(Good health and well-being) <br> SDG4(Quality education) <br> SDG8(Decent work and economic growth) <br> SDG11(Sustainable cities and economies) |
|---|---|---|---|

## Part B

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| 1 | Digital Image Introduction: Steps in Digital Image Processing and the Need for Digital Image Processing, Application and Components of Image Processing System. Visual Preliminaries: Brightness Adaptation and Contrast, Neighborhood of pixel, D4, D8 and Dm distances, Adjacency, path and connectivity. | Lecturing | 15 |
| 2 | Image Processing Image Enhancement: Contrast Stretching, Smoothing, Image Averaging, Mean Filter, Ordered Statistic Filter: Median Filter, Low Pass Filtering. Image Sharpening, High, Pass Filtering, Homomorphic Filtering. | Lecture and experiments | 10 |
| 3 | Image Transformation Basic Intensity Transformation Functions, Histogram, Histogram Equalization, Histogram Matching, Spatial Correlation and Convolution Error Criterion: Lossy Compression methods, loss –less compression, Huffman coding, Run length coding- Block coding, Quad Tree coding- contour coding. | Lecture and experiments | 15 |
| 4 | Color Processing and Image Segmentation: Color Fundamentals, RGB, CMY and HSI Color Models, Image Segmentation: Edge Models, Edge Detection, Global and Variable Thresholding, Single and Multiple Thresholds, Region Based Segmentation. | Lecture and experiments | 10 |
| 5 | Morphology, Representation and Description: Mathematical Morphology, Erosion and Dilation, Opening and Closing, Boundary Extraction algorithm. Border Following Algorithm, Chain Codes, Minimum Perimeter Polygons, Boundary Descriptors, Regional Descriptors. | Lecture and experiments | 15 |

**ITM**
UNIVERSITY
GWALIOR · MP · INDIA

# PBL Submission Guideline

**Subject Name: BCAH/BCA VI**

**Faculty In-charge: Ms. Ayushi Gupta**

**Total Marks: 30**

| Sr. No. | Submission to be done | Submission Required | Marks Allotment |
|---|---|---|---|
| 1 | Select Project Topic and team submission | Small presentation | 2 |
| 2 | Introduction & Objective of Project | PBL file | 3 |
| 4 | Background Study and the existing gap in particular area | PBL file | 5 |
| 5 | System Design (Flowcharts/Block Diagrams/ Algorithms/DFD/ER diagrams), Implementation of code, and submission of running model. | PBL File & Implementation | 10 |
| 7 | Final Project file submission (Strictly as per the format) | Presentation & Viva Voce | 10 |

**Topic List:**

Q Create PBL on any given Topic

- **License plate recognition**
- **Face Emotion recognition**
- **Face recognition**
- **Cancer detection**
- **Object detection**
- **Pedestrian detection**
- **Lane detection for ADAS**
- **Blind assistance systems**
- **Gesture recognition**
- **Drowsy driver detection**
- **Barcode Detection**
- **Image Enhancement and Restoration**
- **Image-to-Text Conversion**

## Part D(Marks Distribution)

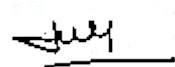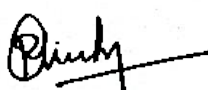| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 20 | 60 | |

| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 50 | 40 | 20 | 60 | |

## Part E

| | |
|---|---|
| Books | Gonzalez, R. C., & Woods, R. E. (2008). Digital Image Processing (3rd ed.). Pearson Education Inc. |
| Articles | |
| References Books | Jain, A. K. (1989). Fundamentals of Digital Image Processing. Prentice Hall. Gonzalez, R. C., Woods, R. E., & Eddins, S. L. (2020). Digital Image Processing using Matlab. McGraw Hill Education. |
| MOOC Courses | |
| Videos | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 2 | - | - | - | 1 | 2 | - | - | - | 2 | - | - | 2 | 2 | 1 |
| CO2 | 1 | - | - | - | 1 | 2 | - | - | - | - | - | - | 2 | 2 | 3 |
| CO3 | 2 | 2 | - | 2 | - | - | - | - | - | - | - | - | 1 | - | 2 |
| CO4 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | 1 | 2 | 2 |
| CO5 | 1 | 2 | - | 1 | - | - | - | - | - | - | - | - | 1 | - | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Machine Learning |
|---|---|
| Course Code | BCA 602(B) (T) |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 1 | 4 |

| Course Type | Embedded theory and lab |
|---|---|
| Course Category | Disciplinary Minor |

| Pre-Requisite/s | Basic understanding of Statistical Data Analysis and visualization methods, and Python Programming. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** To remember various concept of data science.**(BL1-Remember)** <br> **CO2-** To understand various Performance evaluation techniques of Machine Learning models. **(BL2-Understand)** <br> **CO3-** To implement various supervised, unsupervised and reinforcement machine Learning Models **(BL3-Apply)** <br> **CO4-** To train & test various machine Learning models using different domains of dataset. **(BL4-Analyze)** <br> **CO5-** To evaluate and summarize the performance of various machine learning models using statistical & visualization tools**(BL5-Evaluate)** <br> **CO6-** To create machine learning models to solve real world problems.**(BL6-Create)** |
|---|---|

| Coures Elements | Skill Development ✓ <br> Entrepreneurship ✗ <br> Employability ✓ <br> Professional Ethics ✗ <br> Gender ✗ <br> Human Values ✗ <br> Environment ✗ | SDG (Goals) | SDG1(No poverty) <br> SDG2(Zero hunger) <br> SDG3(Good health and well-being) <br> SDG4(Quality education) <br> SDG8(Decent work and economic growth) <br> SDG10(Reduced inequalities) |
|---|---|---|---|

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| 1 | Introduction of Machine Learning: What is Machine Learning, Need for Machine Learning, Why & When to Make Machines Learn?, Machine Learning Model, Challenges in Machines Learning, Applications of Machines Learning, Overview of various machine Learning Algorithms, Performance evaluation measures for machine learning algorithms, the curse of dimensionality, Data Feature Selection, Training Data vs. Validation Data vs. Test Data for ML Algorithms, bias-variance trade off, over fitting vs under fitting. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 2 | Supervised Learning-I Regression: Introduction to Regression, Types of Regression Models, Introduction to Linear Regression, Simple Linear Regression, Least square regression, Gradient Descent , Multiple Linear Regression (MLR), Regularization in Linear Regression, Ridge regression, Lasso regression, Polynomial Regression, Support Vector for Regression (SVR). | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 3 | Supervised Learning-II Classification – Introduction to Classification, Types of Learners in Classification, Logistic Regression, K-Nearest Neighbors (K-NN), Support Vector Machine (SVM), Kernel SVM, Naive Bayes, Decision Tree Classification, Random Forest Classification. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 4 | Unsupervised Learning Clustering- Introduction to Clustering, Types of Clustering, Types of Clustering Algorithms, K-Means Clustering, Hierarchical Clustering, DBSCAN Clustering, Association Rule Learning: Introduction to Association Rule Learning, Types of Association Rule Learning, Apriori Algorithm, Eclat Algorithm, F-P Growth Algorithm, Applications of Association Rule Learning. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |
| 5 | Reinforcement Learning: Introduction of Reinforcement Learning, Terms used in Reinforcement Learning, Key Features, Elements of Reinforcement Learning, How does Reinforcement Learning Work?, The Bellman Equation, Types of Reinforcement learning, Markov Decision Process, Reinforcement Learning Algorithms, Reinforcement Learning Applications Performance Improvement of ML Models: Performance Improvement with Ensembles, Ensemble Learning Methods, Bagging Ensemble Algorithms, Boosting Ensemble Algorithms, Voting Ensemble Algorithms. | Lectures with whiteboard/PPT, Recorded video/interactive videos, programming labs | 12 |

## Part C

| Modules | Title | Indicative-ABCA/PBL/ Experiments/Field work/ Internships | Bloom's Level | Hours |
|---|---|---|---|---|
| 1 | Implementation of various performance evaluation techniques of machine learning | Experiments | BL3-Apply | 02 |
| 2 | Implementation of various regression models of machine learning | Experiments | BL3-Apply | 04 |
| 3 | Implementation of various classification models of machine learning | Experiments | BL3-Apply | 03 |
| 4 | Implementation of various clustering models of machine learning | Experiments | BL3-Apply | 03 |
| 5 | Implementation of RL, bagging and boosting models of machine learning | Experiments | BL3-Apply | 03 |
| 1-5 | Problem Based Learning | PBL | BL6-Create | 15 |

## Part D(Marks Distribution)

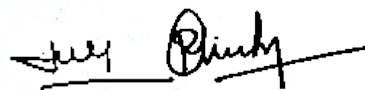### Theory

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 40 | 40 | 12 | 60 | |

### Practical

| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
|---|---|---|---|---|---|
| 100 | 50 | 40 | 20 | 60 | |

## Part E

| | |
|---|---|
| **Books** | Andreas C. Müller, Sarah Guido.(2016).Introduction to Machine Learning with Python: A Guide for Data Scientists.1st ed.O'Reilly Media. |
| **Articles** | |
| **References Books** | Tom M. Mitchell.(2017).Machine Learning.1st ed.McGraw Hill Education. Dr S. Sridhar, Dr M. Vijayalakshmi.(2021).Machine Learning.1st ed. Oxford University Press. Manaranjan Pradhan, U Dinesh Kumar.(2019).Machine Learning using Python.1st ed. Wiley India. |
| **MOOC Courses** | Prof. S. Sarkar.(2023).Introduction to Machine Learning, IIT Kharagpur.https://nptel.ac.in/courses/106105152 Dr. Balaraman Ravindran. (2024).Introduction to Machine Learning, IIT Madras.https://nptel.ac.in/courses/106106139 |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| CO1 | 1 | - | - | - | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 1 |
| CO2 | 1 | 2 | 1 | 2 | 2 | 2 | - | - | - | 2 | - | - | 1 | - | 3 |
| CO3 | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 3 | 3 |
| CO5 | 2 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 |
| CO6 | 2 | 1 | 1 | 2 | 2 | - | - | - | - | 2 | - | - | 2 | 2 | 3 |
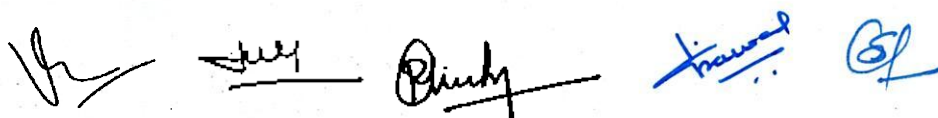
# Syllabus-2022-2023

## (SOET)(BCA)

| Title of the Course | Digital Forensic Essentials |
|---|---|
| Course Code | BCA 602(C)-T |

## Part A

| Year | | Semester | | Credits | L | T | P | C |
|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 0 | 1 | 4 |

| Course Type | Embedded theory and lab |
|---|---|
| Course Category | Disciplinary Minor |

| Pre-Requisite/s | Basic knowledge of computer fundamentals, hardware, algorithms and basic concepts of network. | Co-Requisite/s | |
|---|---|---|---|

| Course Outcomes & Bloom's Level | **CO1-** Remembering Computer Network basics and Network Defense Essentials**(BL1-Remember)**<br>**CO2-** Understand the concepts of Digital Forensics Digital investigation, Digital crime scene Evaluation process**(BL2-Understand)**<br>**CO3-** Apply to the identification of crime and investigate (apply).**(BL3-Apply)**<br>**CO4-** Analyze the data from digital devices for forensic analysis and finalize the audit report(Analyse)**(BL4-Analyze)**<br>**CO5-** Evaluating Evaluation of various crimes and the techniques applied to perform the crimes in digital world.(Investigate)**(BL5-Evaluate)** |
|---|---|

| Coures Elements | Skill Development ✓<br>Entrepreneurship ✗<br>Employability ✗<br>Professional Ethics ✗<br>Gender ✗<br>Human Values ✗<br>Environment ✗ | SDG (Goals) | SDG1(No poverty)<br>SDG2(Zero hunger)<br>SDG3(Good health and well-being)<br>SDG4(Quality education)<br>SDG8(Decent work and economic growth)<br>SDG10(Reduced inequalities) |
|---|---|---|---|

| Modules | Contents | Pedagogy | Hours |
|---------|----------|----------|-------|
| 1 | Introduction to Digital Forensics Digital investigation, Digital crime scene evaluation process, Search & Seizure, Digital Forensic Lab Setup, Dead v/s Live Forensics, Types of Digital Evidences, Disk Imaging, Write Blockers, Data Recovery, Chain of Custody, Standard Operating Procedures, Investigation Guidelines, overview of tools, Slack Space, Virtual paging, Volatile Evidence Acquisition, Collection & Analysis | Lecturing, Experiments | 7 |
| 2 | Volume Analysis & File Systems Introduction, PC based partitions- DOS partitions, UNIX partitions, RAW partition, UNIX Console Log, Removable media, Server based partitions- BSD partitions, GPT & MBR partitions, multiple disk volumes- RAID, Disk Spanning, file system, File system category, FAT concepts and analysis, FAT data structure- Boot sector, FAT 32 FS info, Directory entries, Long file name directory entries, NTFS File System concepts, NTFS Analysis, NTFS data structure, Standard file attributes, Index attributes and data structures | Lecturing, Case Study, Experiments | 8 |
| 3 | Digital Evidence Analysis Potential Evidences, Evidence collection form different devices, Artifact interpretation, Operating System artifacts analysis, Network Artifacts analysis, File Signatures, Registry Forensics, Last user Activity, MRU, NTUSER.DAT, MFT concepts, MFT Forensics, Multimedia Forensics, Metadata Analysis, Browser Forensics, History Extraction, Cookies based artifacts, Autofill Forms, Cache, Temp file, MAC OS Artifacts analysis, Linux OS Artifact Analysis | Lecturing, Case Study, Experiments | 10 |
| 4 | NIX File Systems UNIX, Ext2 and Ext3 data structures, iNodes, Super block, group descriptor tables, Block bitmap, Extended attributes, Directory Entry, Symbolic Link, Hash trees, Journal data structures, UFS1 and UFS2 concepts and analysis, NFS Files Systems, HFS File Systems, CDF File systems, Hadoop File systems | Lecturing, Case Study, Experiments | 8 |
| 5 | Forensic Tools :Forensic tools collection, Automated v/s manual techniques, Open source forensic tools, Developing scripted tools for basic level investigation, Usage tools for disk imaging and Data recovery, Encase and FTK tools, Autopsy, UFED, XRY, Volatility, Rekall, RedLine, NetworkMiner, Anti forensics Techniques, Counter anti forensics. | Lecturing, Case Study, Experiments | 10 |

# Activity I

# BCA-602

# (Digital Forensic Essentials)

## Activity type: Survey

## Individual Activity

**Guidelines:**

1. Create a questionnaire for testing general cyber security measures a layman should adopt . Each question in the questionnaire should contain one mark and should have four options for answer. No descriptive questions should be there in the questionnaire.

2. The questionnaire should contain 25 questions related to using safety measures an individual should take to safe guard his / her laptop / mobile/ tab etc.

3. In addition to these questions the questionnaire should also contain following questions which should have descriptive questions: Name, City, state, age as on 1.07.2023, gender, profession (This should be a dropdown list having following options: home maker, Service, Self-employed, student, teacher), phone no./ email id

4. The questionnaire should be shared with at least 50 people and at least 40 entries should be recorded.

5. This assignment should be created as a goggle form and the form as well as the excel sheet of responses should be uploaded as submission.

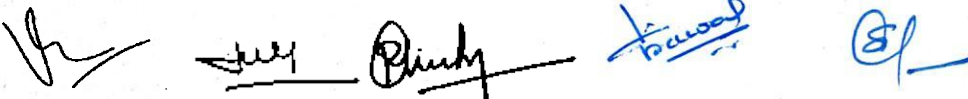6. This is an individual activity and not a group activity.

**Guidelines:**

1. This is an individual activity.
2. Please refer to the following list of web application threats and select any three of them:

### Web Application Threats

| | | | | | |
|---|---|---|---|---|---|
| 01 | Cookie Poisoning | 07 | Cross-Site Scripting (XSS) | 13 | Information Leakage |
| 02 | SQL Injection | 08 | Sensitive Data Exposure | 14 | Improper Error Handling |
| 03 | Injection Flaws | 09 | Parameter/Form Tampering | 15 | Buffer Overflow |
| 04 | Cross-Site Request Forgery | 10 | Denial of Service (DoS) | 16 | Insufficient logging and monitoring |
| 05 | Directory Traversal | 11 | Broken Access Control | 17 | Broken Authentication |
| 06 | Unvalidated Input | 12 | Security Misconfiguration | 18 | Log Tampering |

3. Document the following about the threats selected:
   a. Attack Surface(s)
   b. Attack Vector(s)
   c. Methodology used for attack in form of block diagram
   d. An example or case study of this kind of attack performed
   e. Ways/methods/ tools/ command to detect the attacks in following environment:
      i. Window's
      ii. Linux
4. Comparative analysis of the attacks under consideration on following parameters:
   a. Attack surfaces used
   b. IOC
   c. Possible Damage level
5. The report should be in MS- word format on an A-4 size paper.
6. The report should be submitted in soft copy online as well as hard copy

# Practical List

## BCA-602

### (Digital Forensic Essentials)

1. Study of Computer Forensics and different tools used for forensic investigation

2. How to Recover Deleted Files using Forensics Tools

3. How to make the forensic image of the hard drive using FTK Forensics.

4. How to used sniffer tool in network forensics.

5. How to View Last Activity of Your PC

6. How to prepared the RAM Dump using FTK Tool

7. How to Collect Email Evidence in Victim PC

8. Find Last Connected USB on your system (USB Forensics)

9. Live Forensics Case Investigation using Autopsy

10. Comparison of two Files for forensics investigation by Compare IT software

## Part D(Marks Distribution)

| Theory | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 40 | 40 | 12 | 60 | |

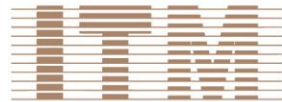| Practical | | | | | |
|---|---|---|---|---|---|
| Total Marks | Minimum Passing Marks | External Evaluation | Min. External Evaluation | Internal Evaluation | Min. Internal Evaluation |
| 100 | 50 | 40 | 20 | 60 | |

## Part E

| | |
|---|---|
| **Books** | Carvey, H. A. (2014). Windows Forensic Analysis Toolkit: Advanced Analysis Techniques for Windows 7. Syngress. |
| **Articles** | |
| **References Books** | Marshall, A. M. (2008). Digital Forensics: Digital Evidence in Criminal Investigation. Wiley-Blackwell. |
| **MOOC Courses** | |
| **Videos** | |

## Course Articulation Matrix

| COs | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | 1 | - | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 1 |
| CO2 | - | 1 | 1 | 1 | 2 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| CO3 | 2 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 3 |
| CO4 | - | 2 | 1 | 2 | - | - | - | - | - | - | - | - | 2 | 1 | 3 |
| CO5 | 2 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 2 | 2 |
| CO6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

# DEPARTMENT OF ELECTRICAL ENGINEERING

# Department of Electrical Engineering

## Minutes of BOS Meeting

In order to review the schemes of B. Tech. Electrical Engineering (Specialization in IoT & Sensors) a meeting of BOS was conducted in an online mode on 1st of June 2022 due to COVID-19 pandemic. This meeting is in continuation of BOS meeting previously held on 1st of June 2021.

The following members were present in the meeting:

| Sr. No. | Name | Designation | Digital Signature |
|---|---|---|---|
| 1 | Dr. Ranjeet Singh Tomar | Dean & Chairman | |
| 3 | Dr. G. S. Tomar | Expert | |
| 4 | Dr. Manish Sharma | Invitee Member | |
| 5 | Dr. Mukesh Pandey | Invitee Member | |
| 5 | Mr. Abhishek Saxena | Member | |
| 6 | Mr. Abhishek Tripathi | Member | |
| 7 | Mr. Upendra Kumar Bhusan | Member | |

Following decisions were taken after discussion:

1. Approval of minutes of the last BOS meeting held on 1st of June 2021.

2. The schemes of

- B. Tech. Electrical Engineering VII & VIII Semester for batch of 2019 have been approved.

- NCC Credit to be incorporated in BOS and its decision to be taken on university level.

- Subjects are categorized as information, critical thinking and research based.

- The Board of Studies recommended above discussed points further for approval by Academic Council of the University.

Note: Further changes in any course introduced by the regularity bodies will be incorporated after the approval of BOS / Academic Council.

Syllabus attached in Annexture-1

(Dr. Ranjeet Singh Tomar)
Dean and Chairman BOS
Department of Electrical Engineering
School of Engineering & Technology
ITM University Gwalior (MP)